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DEVELOPMENT DIGEST

A quarterly journal of excerpts, summaries, and reprints of current materials on economic and social development

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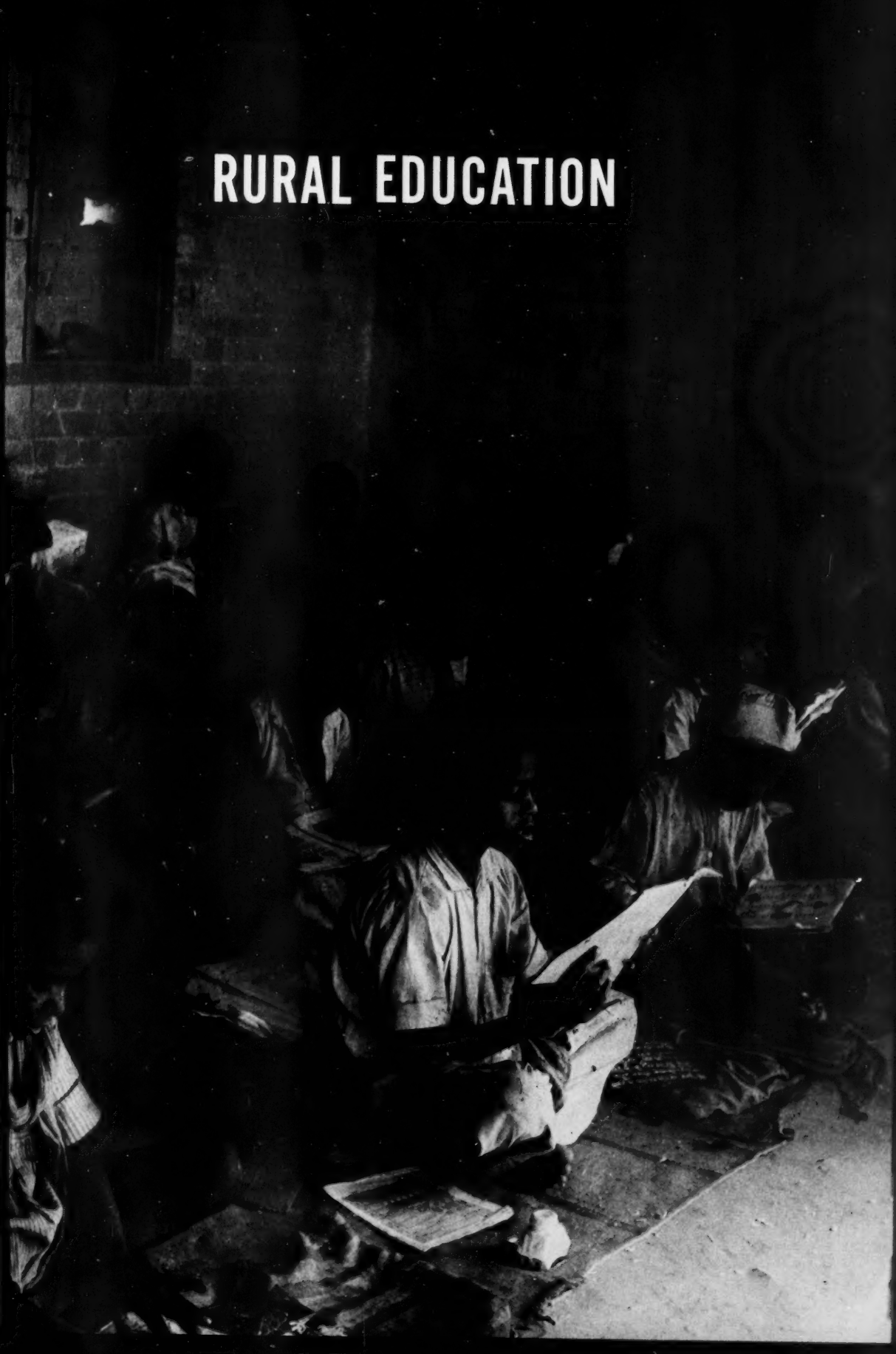

RURAL SCHOOL IN INDIA
(PHOTO: FOOD AND AGRICULTURE
ORGANIZATION OF THE UNITED NATIONS)

Education for Self-Reliance

Julius Nyerere

[Education should be designed to create the kind of society that is wanted in a new nation, given its economic circumstances. If it is accepted that the goals are equality and human dignity, sharing of resources and hard work, the educational system should be reshaped to produce these results.]

Since long before independence the people of this country have been demanding more education for their children. But we have never really stopped to consider why we want education--what its purpose is. We have not until now questioned the basic system of education which we took over at the time of independence because we have never thought about education except in terms of obtaining teachers, engineers, administrators, etc., as a training for the skills required in the modern sector of our economy. It is now time that we looked again at the justification for a poor society like ours spending almost 20 percent of its government revenues on providing education for its young people, and began to consider what that education should be doing.

The educational systems in different societies in the world have been, and are, very different in organization and in content. They are different because the societies providing the education are different, but they have a common purpose: to transmit from one generation to the next the accumulated wisdom and knowledge of the society, and to prepare the young people for their future membership in the society and their active participation in its maintenance or development. The fact that pre-colonial Africa did not have "schools" did not mean that the children were not educated. They learned

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the kind of grasses which were suitable for which purposes, or the care which had to be given to animals, by joining with their elders in this work. They learned the tribal history, and the tribe's relationship with other tribes and with the spirits, by listening to the stories of the elders. Through these means, the values of the society were transmitted. Education was thus "informal;" every adult was a teacher to a greater or lesser degree. This lack of formality may have made the education more directly relevant to the society in which the child was growing up. In Europe education has been formalized for a very long time. An examination of its development will show, however, that it has always had similar objectives to those implicit in the traditional African education.

The education provided by the colonial government in Tanzania, however, had a different purpose. It was motivated by a desire to inculcate the values of the colonial society and to train individuals for the service of the colonial state. State interest in education stemmed from the need for local clerks and junior officials; on top of that, various religious groups were interested in spreading literacy and other education as part of their evangelical work. This statement of fact is not given as a criticism of the many individuals who worked hard, often under difficult conditions, in teaching and in organizing education, nor does it imply that all the values these people transmitted in the schools were wrong or inappropriate. What it does mean, however, is that the education introduced into Tanzania was modeled on the British system, but with even heavier emphasis on subservient attitudes and on white-collar skills. Inevitably, too, it was based on the assumptions of a colonial and capitalist society: it induced attitudes of human inquality, and in practice underpinned the domination of the weak by the strong, especially in the economic field. Colonial education was not transmitting the values and knowledge of Tanzanian society from one generation to the next; it was a deliberate attempt to change those values and to replace traditional knowledge by the knowledge from a different society.

Action Since Independence

The independent state of Tanzania inherited a system of education which was in many respects both inadequate and inappropriate for the new state. So little education had been provided that in December 1961, we had too few people with the necessary education qualifications even to man the administration of government as it was then, much less undertake the big economic and social development work which was essential. Neither was the school population in 1961 large enough to allow for any expectation that this situation would be speedily corrected.

The three most glaring faults of the educational inheritance have already been tackled. First, the racial distinctions within education

were abolished; complete integration of the separate racial and religious systems was introduced very soon after independence. Secondly, there has been a very big expansion of educational facilities available. In 1961 there were 490,000 children attending primary schools in Tanganyika, the majority of them for only four years. In 1967 there were 825,000 children attending such schools, and increasingly these will be full seven-year primary schools. In 1961 there were 11,832 children in secondary schools, only 176 of whom were in the graduating class; in 1967 there were 25,000 and 830. The third action we have taken is to make the education provided in all our schools much more Tanzanian in content. Yet all these things are modifications of the system we have inherited. Their results have not yet been seen; it takes years for a change in education to have its effect.

What Kind of Society Are We Trying to Build?

Only when we are clear about the kind of society we are trying to build can we design our educational service to serve our goals. We have stated many times that we want to create a socialist society based on three principles: equality and respect for human dignity; sharing of the resources which are produced by our efforts; work by everyone and exploitation by none. It is obvious, however, that if we are to make progress toward these goals, we in Tanzania must accept the realities of our present position. Our United Republic has at present a poor, undeveloped, and agricultural economy. We have very little capital to invest in big factories; we are short of people with skill and experience. What we do have is land in abundance and people who are willing to work hard for their own improvement. If we use these resources in a spirit of self-reliance as the basis for development, then we shall make progress slowly but surely. And it will then be real progress, affecting the lives of the masses, not just spectacular showpieces in the towns while the rest of the people live in poverty.

Pursuing this path means that Tanzania will continue to have a predominantly rural economy for a long time to come. As it is in the rural areas that people live and work, so it is in the rural areas that life must be improved. We have some industries now and they will continue to expand; but it would be grossly unrealistic to imagine that in the near future more than a small proportion of our people will live in towns and work in modern industrial enterprises. It is therefore in the villages that people must be able to find their material well-being and their satisfactions. This improvement in village life will not, however, come automatically. It will come only if we pursue a deliberate policy of using the resources we have--our manpower and our land--to the best advantage.

This is what our education system has to encourage. It has to foster the social goals of living together, and working together, for the

common good. It must emphasize cooperative endeavor, not individual advancement; it must stress concepts of equality and the responsibility to give service which goes with any special ability, whether it be in carpentry, in animal husbandry, or in academic pursuits. In particular, our education must counteract the temptation to intellectual arrogance, with the well-educated despising those whose abilities are non-academic or who have no special abilities but are just human beings.

Our educational system must also prepare young people for the work they will be called upon to do in the society which exists in Tanzania--a rural society where improvement will depend largely upon the efforts of the people in agriculture and in village development. It must produce good farmers; it has also to prepare people for their responsibilities as citizens in a free and democratic society, albeit a largely rural society. The education provided must therefore encourage the development in each citizen of three things: an inquiring mind; an ability to learn from what others do, and reject or adapt it to his own needs; and a basic confidence in his own position as a free and equal member of the society. However much agriculture a young person learns, he will not find a book which will give him all the answers to all the detailed problems he will come across on his own farm. He will have to learn the basic principles of modern knowledge in agriculture and then adapt them to solve his own problems. Similarly, the free citizens of Tanzania will have to judge social issues for themselves; there neither is, nor will be, a political "holy book" which purports to give answers to all the problems which will face our country.

The Existing Educational System

There are four basic elements in the present system which prevent, or at least discourage, the integration of the pupils into the society they will enter, and which do encourage attitudes of inequality, intellectual arrogance, and intense individualism.

First, the education we are providing is basically an elitist education designed to meet the interests and needs of a very small proportion of those who enter the school system. Although only about 13 percent of our primary school children will get a place in a secondary school, the basis of our primary school education is the preparation of pupils for secondary schools. Thus 87 percent of the children who finished primary school last year do so with a sense of failure. It induces a feeling of inferiority among the majority, hankering after something they will never obtain. The other 13 percent have a feeling of having deserved a prize--and the prize they and their parents expect is high wages, comfortable employment in towns, and personal status in the society. The same process operates again at the next level when entrance to university is at issue.

Second, Tanzania's education is such as to divorce its participants from the society it is supposed to be preparing them for. This is particularly true of secondary schools, which are inevitably almost entirely boarding schools where students are sent many miles from home to live in an enclave. But to some extent, and despite recent modifications in the curriculum, it is true of primary schools too. The school is a place children go to at age seven and which they and their parents hope will make it unnecessary for them to become farmers and continue living in the villages. Many people have come to regard education as meaning that a man is too precious for the rough and hard life which the masses of our people still live.

The third point is that our present system encourages school pupils in the idea that all knowledge which is worthwhile is acquired from books or from "educated people"--meaning those who have been through a formal education. The knowledge and wisdom of other old people is despised, and they themselves are regarded as ignorant and of no account. Our pupils learn to despise even their own parents because they are "old fashioned." Government and party tend to judge people according to whether they have "passed school certificate," "have a degree," etc. If a man has these qualifications, we assume he can fill a post; we do not wait to find out about his attitudes, his character, or any other ability. If a man does not have these qualifications, we assume he cannot do a job; we ignore his knowledge and experience. A man is not necessarily wise because he is old; a man cannot necessarily run a factory because he has been working in it as a laborer or storekeeper for 20 years. But equally he may not be able to do so if he has a doctorate in commerce. The former may have honesty and ability to weigh men; the latter may have the ability to initiate a transaction and work out the economics of it; both qualifications are necessary. The same thing applies in relation to agricultural knowledge.

Finally, our poor nation is taking out of productive work some of its healthiest and strongest young men and women. Whereas in a wealthy country like the United States of America it is common for young people to work their way through high school and college, in Tanzania the structure of our education makes it impossible for them to do so. How many of our students spend their vacations doing a job which could improve people's lives--jobs like digging an irrigation channel or demonstrating the construction and explaining the benefits of deep-pit latrines? A small number have done such work in the National Youth Camps or through school-organized schemes, but they are the exception.

Can the Faults be Corrected?

There are three major aspects which require attention: the content of the curriculum, the organization of the schools, and the entry age

into primary schools. We cannot integrate the students into the future society simply by theoretical teaching, however well designed it is. Neither can the society fully benefit from an education system which is thoroughly integrated into local life but does not teach people the basic skills--for example, of literacy and arithmetic--or which fails to excite in them a curiosity about ideas. Nor can we expect those finishing primary schools to be useful young citizens if they are still only 12 or 13 years of age.

It is also essential that we face the facts of our present economic situation. Every penny spent on education is money taken away from some other needed activity--whether it is an investment in the future, better medical services, or just more food. And the truth is that there is no possibility of Tanzania's being able to increase the proportion of the national income spent on education; it ought to be decreased. Therefore we cannot solve our present problems by any solution which costs more than is at present spent; in particular we cannot solve the "problem of primary school-leavers" by increasing the number of secondary school places. It is going to be a long time before we can provide universal primary education in Tanzania; it is only a few who will have the chance of going on to secondary schools, and only a fraction of these will have the opportunity of going on to a university. These are the economic facts of life for our country. The choice before us is how we allocate the limited educational opportunities, and whether we emphasize the individual interests of the few or design our educational system to serve the community as a whole. And for a socialist state only the latter is really possible.

The implication of this is that the education given in our primary schools must be a complete education in itself. It must not continue to be simply a preparation for secondary school. Instead of the primary school activities being geared to the competitive examination which will select the few who go on to secondary school, they must be a preparation for the life which the majority of the children will lead. Similarly, secondary schools must not be simply a selection process for the university, teachers' colleges, and so on. They must prepare people for life and service in the rural areas of this country. The teacher in a seven-year primary school needs an education which goes beyond seven years; the extension officer who will help a population with a seven years' education needs a lot more himself. Other essential services need higher education--e.g., doctors, engineers; but publicly provided "education for education's sake" must be general education for the masses.

This is easy to say but to do it requires a radical change, not only in the education system but also in many existing community attitudes. In particular, it requires that examinations should be downgraded in government and public esteem. We have to recognize that although

they have certain advantages--for example, in reducing the dangers of nepotism and tribalism in a selection process--they have severe disadvantages too. As a general rule they assess a person's ability to learn facts and present them on demand within a time period. They do not always succeed in assessing a power to reason, and they certainly do not assess character or willingness to serve. At present our curriculum and syllabus are geared to the examinations set, and the examinations our children take are themselves geared to an international standard and practice which has developed regardless of our particular problems and needs. What we need to do is think first about the education we want to provide, and then about how some form of examination should be designed to fit the education provided.

We should change the things we demand of our schools. We should not determine the type of things children are taught in primary schools by the things a doctor, engineer, teacher, economist, or administrator needs to know. Most of our pupils will never be any of these things. We should determine the type of things taught in the primary schools by the things which the boy or girl ought to know if he, or she, is to live happily and well in a socialist and predominantly rural society, and contribute to the improvement of life there. Our sights must be on the majority; those most suitable for further education will still become obvious, and they will not suffer.

"Every School Should be a Farm"

Alongside this change in curriculum there must be a parallel and integrated change in the way our schools are run. Schools must, in fact, become communities--and communities which practice the precept of self-reliance. There must be the same kind of relationship between pupils and teachers within the school community as there is between children and parents in the village. And the former community must realize, just as the latter do, that their life and well being depend upon the production of wealth--by farming or other activities. This means that all schools, but especially secondary schools and other forms of higher education, must contribute to their own upkeep; they must be economic communities as well as social and educational communities. Each school should have, as an integral part of it, a farm or workshop which provides the food eaten by the community, and makes some contribution to the total national income.

This is not a suggestion for a school farm or workshop for training purposes; it is a suggestion that every school should also be a farm. Obviously if there is a school farm, the pupils working on it should be learning the techniques and tasks of farming. But the farm would be an integral part of the school--and the welfare of the pupils would depend on its output. When this scheme is in operation, the revenue

side of school accounts would not just read as at present, "Grant from Government.... Grant from voluntary agency or other charity...." They would read "Income from sale of cotton (or other cash crop).... Value of food grown and consumed.... Value of labor done by pupils on new building, repairs, equipment, etc.... Government subvention.... Grant from...." This is a break with our educational tradition, and unless its purpose and its possibilities are fully understood by teachers and parents, it may be resented at the beginning. But it is not a regressive measure, nor a punishment either for teachers or pupils. It is a recognition that we in Tanzania have to work our way out of poverty, and that we are all members of the one society, depending upon each other. There will be difficulties of implementation, especially at first, for we do not now have a host of experienced farm managers who could serve on the new school farms. But this is not an insuperable difficulty. Indeed, by using good local farmers as supervisors and teachers of particular aspects of the work, we shall be helping to break down the notion that only book learning is worthy of respect.

This concept of schools contributing to their own upkeep does not mean using our children as laborers who follow traditional methods. On the contrary, on a school farm pupils can learn by doing. The advantages of improved seeds, of simple ox-ploughs, and of proper methods of animal husbandry can become obvious; and the pupils can learn by practice how to use these things to the best advantage. The properties of fertilizers can be explained in the science classes, and their use and limitations experienced by the pupils as they see them in use. The possibilities of proper grazing practices, and of terracing and soil conservation methods can all be taught theoretically, at the same time as they are put into practice. But the school farms must not be, and indeed could not be, highly mechanized demonstration farms. We do not have the capital necessary for this, nor would it teach the pupils anything about the life they will be leading. The school farms must be used with no more capital assistance than is available to an ordinary, established, cooperative farm.

Where schools are situated in rural areas, the school farm can be part of the school site. In towns a school might put more emphasis on other productive activities, or it may be that in boarding schools the pupils can spend part of the school year in the classroom and another part in camp on a school farm some distance away.

To Inculcate Responsibility

The most important thing is that the school members should learn that it is their farm, and that their living standards depend on it. Pupils should be given an opportunity to make many of the decisions necessary--for example, whether to spend money they have earned

on hiring a tractor to get land ready for planting, or whether to use that money for other purposes on the farm or in the school and do the hard work themselves. If they work badly, then they themselves will suffer. In this process government should avoid laying down detailed and rigid rules; each school must have considerable flexibility. Only then can the potential of that particular area be utilized, and only then can the participants practice--and learn to value--direct democracy. By such means our students will also learn the value of working together with the local non-school community. For they will learn for example that irrigation may be possible if they work with neighboring farmers, and also that development requires a choice between present and future satisfaction, both for themselves and their village.

At the beginning it is probable that a good number of mistakes will be made. But although guidance must be given by the school authorities and a certain amount of discipline exerted, the pupils must be able to participate in decisions and learn by mistakes. For example, they can learn to keep a school farm log in which proper records are kept of the work done, the fertilizers applied, or food given to the animals, etc., and the results from different parts of the farm. Then they can be helped to see where changes are required, and why. For it is also important that the idea of planning be taught in the classroom and related to the farm; the whole school should join in the programing of a year's work, and the breakdown of responsibility and timing within that overall program.

Many other activities now undertaken for pupils, especially in secondary schools, should be undertaken by the pupils themselves. After all, a child who starts school at seven years of age is already 14 before he enters secondary school, and may be 20 or 21 when he leaves. Yet in many of our schools now we employ cleaners and gardeners, and the pupils get used to the idea of having their food prepared by servants, their plates washed up for them, and their rooms cleaned. If they are asked to participate in these tasks, they feel aggrieved and do as little as possible. They have not learned to take a pride in having clean rooms and nice gardens, in the way that they have learned to take a pride in a good essay or a good mathematics paper. But is it impossible for these tasks to be incorporated into the total teaching task of the school? Is it impossible for secondary schools, at least, to become reasonably self-sufficient communities, where only the teaching and supervisory skills are imported from outside? Although primary schools cannot accept the same responsibility for their own well being as secondary schools, it is absolutely vital that they, and their pupils, should be thoroughly integrated into the village life. The children must have responsibilities to the community, and have the community involved in school activities. The school work terms must be so arranged that the children can participate in the family farms or community farms. At present children

who do not go to school work on the family or community farm, or look after cattle, as a matter of course. It must be equally a matter of course that the children who do attend school should participate in the family work--not as a favor when they feel like it, but as a normal part of their upbringing.

Other Changes

This new form of working in our schools will require some considerable organizational change. It may be that the present division of the school year into rigid terms with long holidays would have to be re-examined; animals cannot be left alone for part of the year, nor can a school farm support the students if everyone is on holiday when the crops need planting or harvesting. But it should not be impossible for school holidays to be staggered so that different classes go at different periods or, in double-stream secondary schools, for part of a class to go at one time and the rest at another.

One difficulty in the way of this kind of reorganization is the present examination system; if pupils spend more of their time on learning to do practical work, and on contributing to their own upkeep in the development of the community, they will not be able to take the present kind of examinations--at least within the same time period. It is, however, difficult to see why the present examination system should be regarded as sacrosanct. Other countries are moving away from this method of selection. There is no reason why Tanzania should not combine an examination, which is based on the things we teach, with a teacher and pupil assessment of work done for the school and community. Once a more detailed outline of this new approach to education is worked out, the question of selection procedure should be looked at again.

It will probably be argued that if the children are working as well as learning they will be able to learn less academically, and that this will affect standards in the professions throughout our nation in time to come. In fact it is doubtful whether this is necessarily so; the recent tendency to admit children to primary schools at ages five and six years has almost certainly meant that less can be taught at the early stages. The reversion to seven or eight years entrance will allow the pace to be increased somewhat; the older children inevitably learn a little faster. A child is unlikely to learn less academically if his studies are related to the life he sees around him. But even if this argument were based on provable fact, it could not be allowed to override the need for change in the direction of educational integration with our national life. For the majority of our people, the thing which matters is that they should be able to read and write fluently in Swahili, that they should have an ability to do arithmetic, and that they should know something of the history, values, and workings of

their country and their government, and that they should acquire the skills necessary to earn their living. Things like health science, geography, and the beginning of English, are also important, especially so that the people who wish may be able to learn more by themselves in later life. But most important of all is that our primary school graduates should be able to fit into, and to serve, the communities from which they come.

The same principles of integration into the community and its needs must also be followed at post-secondary levels. Young people who have been through such an integrated system of education as that outlined are unlikely to forget their debt to the community during an intense period of study at the end of their formal educational life. Yet even at university, medical school, or other post-secondary levels, there is no reason why students should continue to have all their washing up and cleaning done for them. Nor is there any reason why students at such institutions should not be required, as part of their degree or professional training, to spend at least part of their vacations contributing to the society in a manner related to their studies. For example, the collection of local history, work on the census, participation in adult education activities, work in dispensaries, etc., would give the students practical experience in their own fields. For this they could receive the equivalent of the minimum wage, and any balance of money due for work which would otherwise have been done for higher wages could be paid to the college or institution and go toward welfare or sports equipment. Such work should earn credits for the student which count toward his examination result.

Conclusion

The education provided by Tanzania for its students must serve the purposes of the nation. It must encourage the development of a proud, independent, and free citizenry which relies upon itself for its own development, and which knows the advantages and the problems of cooperation. It must ensure that the educated know themselves to be an integral part of the nation and recognize the responsibility to give greater service the greater the opportunities they have had.

[Excerpted from Africa Report. New York: the African-American Institute, Inc., Vol. 12, No. 6, June 1967, pp. 72-79. Reprinted with Permission of President Nyerere.]

The Problems of Rural Education

V. L. Griffiths

[Considering the limitations of developing societies in Africa and Asia, the changes which rural primary education could be expected to bring relate more to attitudes and habits of mind than to specific skills and information. Basic reform would take a generation and become prohibitively expensive, but much can be done with medium-term, medium-cost objectives.]

The Rural Background

Underlying all the differences among the less developed rural areas of the world, there are certain almost universal features. At least, they are sufficiently common to make it advisable to check whether or not they are present in the particular rural area for which one is planning. First, there is poverty; this is unlikely to be the abject poverty which may be found in cities, but the general level of wealth is nevertheless likely to be low, and the standard of public services is low compared with the towns. Transistor radios may well be making a triumphant entry, but books and newspapers will be few because a large number of the men and most of the women will be illiterate.

There may or may not be a primary school, and it may or may not give a complete primary course. The village school stands out imposingly in contrast to the huts and small houses, but closer inspection reveals that it, too, is of the simplest construction. The walls are nearly bare and books are few. Often there are difficulties in looking after apparatus and books, even

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when they can be afforded. The classes for the youngest children are often overcrowded, but higher up the school the classes get smaller and smaller. The bigger children are wanted to help at home or in the field, or they may have got bored and left school, or their parents, especially those with increasing families, may no longer be able to afford the fees.

The teachers will usually have had some years of secondary education, in many cases up to school certificate level. Some will, in addition, have had two years at a teacher-training college, but many will be untrained, especially in those areas where there has been a rapid expansion of education. Their general background and sophistication will be very limited. They will not be the intellectual cream of their generation, because there are so many more attractive careers than teaching. Moreover, they suffer from a sense of grievance; their rates of pay are usually not so favorable as those of many others with the same amount of education. In many countries their prestige, which once was high when they were the only educated persons in rural areas, has inevitably slumped with the spread of education. This picture of rural limitations is here and there relieved by the presence of an exceptional individual, a devoted teacher or a strong progressive personality in one of the leading families. Traditional social attitudes, or the impact of agricultural improvement, can drastically modify some of these features of rural life. Nevertheless, for large areas of the developing countries these are the hard conditions which have to be faced, and while outstanding people have emerged from such conditions there is clearly much that calls for improvement.

There are two less obvious features of traditional rural life, however, which it would be unwise to overlook if one wishes to change that life. These are the existence of a social ceiling to individual ambition, and the traditional attitude to authority. In any small, traditional, and close-knit society, where everyone knows about everyone else, the influence of economic incentives on the behavior of the individual is limited. The individual cannot opt out of his group as he can in an urban environment. He must keep within what is socially acceptable if he remains in his village. Society is quick to think up disparaging reasons for the action of an individual who oversteps the mark--he is currying favor with the authorities, he is queer in the head, and so on.

Secondly, long experience has taught many village communities that the best way to deal with outside authority, in the person of officials and the like, is not to argue but to acquiesce--and then do nothing. With any luck the official will soon be transferred elsewhere. If the worst comes to the worst, one can feign stupidity. The official will readily believe that the villagers have not understood. The vil-

lagers "know" that the really stupid people are the officials. The moral of this is that one approaches rural problems with caution, aware the whole time that rural people will not necessarily want what we think we should want in their position; aware, also, that what appears to be agreement, even enthusiasm, on their part may be no more than an habitual protective reaction to the demands of authority.

Commonly Suggested Solutions

Deep disappointment at the slowness of rural progress and the failure of so many schemes of agricultural development sometimes tempt planners to clutch at any apparently bright idea in a field that is not their own. One such apparently bright and sensible idea is to make a fresh start with the young. Why not a new kind of education specially devised for rural areas? The proposal usually comes from writers on social affairs, economists, and politicians, who, though in general knowledgeable about rural affairs, are not in sympathetic touch with rural attitudes. They propose that rural schools should have a special curriculum based on the needs of rural life and taught by a specially trained cadre of rural teachers. Given the conditions in most developing countries such proposals are at present quite definitely non-starters, not because they ignore the needs of the rural areas, but because they ignore what parents want from the schools. No government can afford to ignore this.

Historic aims of going to school. Whatever may be the official aims of education and the hopes of educators, the fact is that most parents look on the schools as a means of escape for their children from the hardships and privations of rural life. To establish special schools for rural children where the curriculum deliberately attempts to keep them on the land is to thwart their hopes and ambitions for their children and for their own old age. This is understandable if one remembers that the modern school was introduced by foreigners, religious bodies, or colonial governments, and its first economic effect was to siphon off a few of the brightest children into clerical and other white-collar employment. The tradition persists, and is unlikely to change until farming can show greater financial returns, stability, and ease than the white-collar jobs.

The best of both worlds. In fact, the proposal for a separate system of rural education is rarely taken seriously by a government. The argument for a less extreme group of suggestions runs like this. It is accepted that rural schools must follow very much the same syllabuses as town schools and that there must be, and must be seen to be, an equal chance for rural boys and girls to move up the educational ladder according to their ability; but rural science, rural studies, practical agriculture or gardening should be taught as alternatives to some of the regular items in the syllabus. In this way, those who

did not succeed in getting white-collar jobs would at least be partially prepared to take part in the improvement of rural life, and they could continue their agricultural training in special vocational schools. In other words, the schools should have a double aim: education leading to white-collar employment, and education leading to farming and an enlightened attitude to rural improvement.

This seems so reasonable that numerous attempts have been made to implement such a policy. Rural teacher-training colleges have been set up in a number of countries to train semi-specialist teachers; agricultural officers have cooperated in devising syllabuses and have sometimes been seconded to the education service; school gardens have been given widespread encouragement and school farms started where conditions appeared suitable. Science syllabuses have been devised which based much of the syllabus on rural material, and agriculture has been accepted as an examinable subject in school-leaving examinations.

But all this with what results? One country which had enthusiastically taken up agriculture as part of its rural primary and middle school program has completely abandoned it after a trial of about a decade. In another, no more than 2 percent of school-leavers in a group of rural schools, teaching rural science, were found to go back voluntarily to farming. In another, a very large and populous country, eight years after the introduction of agriculture as an examinable subject in the school certificate examination only eleven candidates had entered for the paper. One could go on.

Reasons for failure. The natural reaction to the widespread failure is to blame the teaching in the schools, the methods used and the public-spiritedness of the teachers. There may be some truth in this, but for the failure to be so widespread and to have continued over such a long period of time, indeed since the last century, the causes must be stubborn ones. To understand what they are one needs to appreciate the pressures on the teacher and certain practical difficulties.

First, teachers are unlikely to have the support of parents in this part of the curriculum. Parents cannot believe the rural studies or activities can be given equal weight in the examination with the traditional literary studies. (Incidentally, they rarely have much faith in the practical knowledge of a teacher about agricultural matters.) The easiest way to get one's pupils through an examination is to cram them with the facts and let them learn off model answers. Many teachers do not want to do this and know in their hearts that it is bad education, but what can they do when their reputation so often depends on the examination results of their school?

Even if this first obstacle can be overcome, there are others which particularly affect practical activities. A school garden needs to be

quite a large one if pupils are to take a personal interest and do regular manual work in it. Very often the plot available is small, and the pupils work in it occasionally and as a labor gang--which makes them hate gardening. Holidays can occur at times when it is disastrous to leave a garden untended. Teachers may be subject to transfer too frequently, and this can play havoc with the efficiency of continuous practical projects such as a farm or garden. The youth and lack of fundamental scientific knowledge of the pupils can seriously limit what they are capable of doing. Indeed, so discouraging have been the efforts at agriculture and gardening in any but vocational schools that expert agricultural opinion has very largely swung against their being taught at the primary stage, and is even uneasy about the secondary stage.

It is quite true that there are individual schools which have all the appearance of success, but the kind of success they are achieving needs to be looked at more closely. First, there are some whose popularity comes from the offer of a second chance to acquire a general qualification rather than from the rural content of the curriculum. Secondly, there are excellent schools with dedicated staffs and with students who during their time in school throw themselves wholeheartedly into rural studies and spend long hours on their agricultural plots. But after they leave school very few go back to farming; almost all take up salaried, usually white-collar, jobs. One cannot say that their education is wasted. No one will argue that a boy has wasted his time at school learning arithmetic or playing football even if he fails to become an accountant or a professional footballer. But schools with a rural bias often do intend that a large proportion of their students should take to farming.

The difficulty of transfer. One of the schoolmaster's problems, not always recognized by reformers, is how to ensure the transfer to after-school life of ideas and habits learned in school. Children in school are easily influenced by teachers they admire; once they have left school they come under the powerful influence of adults just older than themselves. Few are prepared to stand out against public opinion, particularly in rural society. Return to the land would seem to be confined to cases where the pupil is already a farmer or has the promise of a substantial holding.

The conclusion, then, is that where the public image of farming is that of a poor, old-fashioned, and brutish way of life, the schools are powerless to supply a solution. The Uganda Education Commission's Report of 1963 is one of the most outspoken on this matter:

> ...until there has been a substantial breakthrough from relatively unproductive subsistence land-use to much more intensive and profitable forms of farming in which young people

> can see a reward for their efforts, school-leavers will continue to seek other means of employment. . . . The problems of agricultural education are not primarily educational; they are intimately bound up with the solution of economic, technical and social problems over which the Ministry of Education has no control--systems of land tenure, improved land-use, finance and marketing, research and development, traditions and tribal customs, being among them.

But, given solutions to these non-educational problems, the next question is: in what particular directions could the schools best help a developing rural area?

A Fresh Look at Rural Needs

One can, I think, distinguish two main kinds of educated person required by a developing rural economy other than high-level supervisors and professionals. First, there is the group of employees in the ancillary services, some paid by government or large companies and employed in pest control, irrigation, health services, crop-grading, and market-recording, and some their own masters but involved increasingly in the modern economy and its standards, such as builders, carpenters, automobile and farm machinery repairers, and electricians. Secondly, there is the larger group of peasant farmers and their wives.

In the early stages of economic development, the first group, the ancillary services, may attract the enterprising spirits. The work often has the prestige of modernity and in many cases the security of a salary, while on those who are actually farming tradition hangs heavily, and the educated young often find family control irksome. The task of meeting needs in the second group, the farmers, is more taxing than in the case of the first group, partly because of sheer numbers and partly because the individual farmer needs more judgment and determination to overcome tradition. I therefore propose to ignore the first group and consider that their needs (apart from vocational training) will be met without too much difficulty at the same time as the farmers' needs are met. Farm laborers, whom I have taken not to need schooling in the early stages of development, begin to need education as modern farming methods develop. (This is not an argument for withholding education from the farm laborer, but only for getting our priorities clear.)

With a full-scale development program in being, the primary and lower secondary schools might well be expected to contribute substantially to the achievement of the following objectives in the quality of the rural population:

1. Incentives--to increase one's standard of living.

2. Attitudes and habits--a) inquiring minds, rather than minds which too readily accept a tradition, a superstition, or even a modern authority; b) increased foresight and a readiness to look further ahead, now that nature can be brought more under control; c) increased accuracy and reliability, so that export crops are accurately graded and reliably cleaned; d) initiative in adopting a method on which others in the community are holding back; e) readiness to cooperate in the new ways and with the increased efficiency demanded by more modern institutions, such as cooperatives and women's organizations.

3. Skills--reading, writing, and calculating--e.g., labels and instructions and keeping records of yields and accounts.

4. Knowledge and understanding--of change and basic social and physical sciences: e.g., some appreciation of the fact that the modern world is one of continuing and rapid change, and that this applies to farming as much as to other activities; some understanding of price movements; an elementary insight into scientific method, where it can and where it cannot be applied; and modern ideas on hygiene and food related to what is practicable under local conditions.

Apart from the learning of some elementary skills, the stress here is on acquiring certain attitudes of mind and the bases for understanding and cooperating in change. Adding to the quantity of factual knowledge is not the problem, but changing the quality of thinking very much is. Moreover, these attitudes and understandings are not taught through adding to the curriculum isolated subjects such as elementary science or agriculture, but through permeating all the teaching with these ideas so that they become part of the pupil's thinking and make-up, applicable in all relevant situations.

Planning Requirements

Planning must start with the rural school as it exists, with the kind of teaching and teachers that it has. The school that affects the great mass of people in a rural area is essentially the primary school, though it may in some areas accept children a good deal older than the normal primary age. The teacher will usually have had some secondary education but will not be the cream of his generation, nor is he often brought into touch with progressive influences. It may be argued that unless a teacher were to be paid highly enough for him to afford books, journals, and travel, it were better that he should not be too different from the local community. He will then be happier, will not despise that community and want a transfer to a town. But the fact that a teacher is sufficiently sympathetic to the local community to stay there means that he tends to be overinfluenced by the traditional outlook and is half-hearted over ideas to which the public are unsympathetic.

The kind of teaching in the school is of crucial importance. It tends to stress learning for repetition and for examinations rather than learning for understanding and for use in varied circumstances. Syllabuses are prepared by a central authority, and the teacher, partly from customary attitudes to authority, partly from lack of confidence does not like to deviate much from what is suggested.

A Minimum Objective

In the above list of desirable skills, knowledge, and qualities to nurture in a rural population, there are certain requirements that could be satisfied without much change in the kind of teaching commonly found in the rural schools of developing countries. There are, for example, the simple skills that would be of value in the farmer's daily life--reading instructions, writing for advice, keeping records, calculating yields of local crops. It would not need any radical change in curriculum (which might be resented) or in the kind of teaching (which would require a major reform) to introduce into the upper classes some training in skills of this type. As a first step it would be wise to scrutinize the content of the books used by the children and the "schemes of work" drawn up by teachers. If, as is likely, these are found to have little reference to rural life and its practical activities, it should be possible, without scrapping existing books and schemes, to introduce supplementary material more closely related to the needs and interests of the community.

Even to achieve these humble reforms, it is necessary to devote time and thought to the method of presenting these new materials to the teachers. With poorly educated and often untrained teachers, it is little use expecting brief notes or sketchy outlines to be effective. The material must be worked out in detail for them by educationists experienced in the work of the primary school, and they must be taken through it, step by step, in short courses. The more this supplementary material can be made specific to a locality--perhaps with the help of local development officers--the more chance there is that it will be taught with a sense of realism and not treated as an academic exercise. Even then, one cannot be certain.

I have not included science and agriculture among the subjects where instruction could be markedly improved without a radical change in the methods of teaching. It is true that teachers could be trained to impart specific information on such subjects as terracing and the use of fertilizers, but there is little hope that this kind of instruction in the primary school would eventually be applied intelligently in practice. Nor have I assumed that significant advances can be made, under these conditions, in the inculcation of the "attitudes and habits" listed. "Increased accuracy and reliability" might be brought about in the pupils' academic work even by the present teachers, provided the authorities

launched an intensive campaign to achieve it and appointed sufficient inspectors to enforce new standards in the village schools. But such "campaigns" in education, unsupported by more sweeping reforms, are more easy to launch than to maintain.

It might appear that the limited measures I have suggested to achieve this minimum objective are no more than a gesture; but, where neither leadership nor money are available for more fundamental reforms, I believe that such a gesture is worth making because it is a sign to all that the schools are not entirely divorced from local development. The resources needed to introduce these simple adaptations of teaching to local conditions are not very great. Two or three experts, employed over a year or two, could analyze the existing syllabuses and texts and, with the aid of inspectors and training college staffs, prepare supplementary materials that would enable even inadequately equipped teachers to develop in the classroom the kinds of skill I have mentioned. The same people could be responsible for organizing short refresher courses to train teachers in the use of the new materials.

A Maximum Objective

It is clear that the remainder of the requirements set out above cannot be met by learning for repetition, but are concerned with understanding and with ways of looking at things--even if those ways be very elementary. The difficulty of establishing new outlooks permanently is often underestimated by reformers and by idealistic educationists who should know better. Neither syllabuses nor techniques of teaching are the most relevant points; some countries have a remarkable record of changing syllabuses without noticeable effect on the schools.

The difficulties in the way of making what is really a revolution in the kind of teaching in the schools are very considerable. In the first place, since it is a basic duty of the teacher to teach elementary skills in the three Rs and certain established factual knowledge, he resists the idea of encouraging children to find things out for themselves. It seems to him a waste of time, when he could just tell them. Secondly, if inquiry is encouraged, the poorly educated and ill-read teacher may find himself far too frequently unable to deal with children's questions. Thirdly, a forward-looking but realistic concern to link the simplified, clear-cut knowledge of the classroom with the complicated, changing affairs of everyday life not only is to exchange certainty for uncertainty, but seems to many to conflict with the duty of teaching the children a standard set of skills and information on which they can be examined.

The teacher who can skillfully combine the teaching of reading, writing and arithmetic with a stimulating, forward-looking, intellec-

tually stringent treatment of his pupils is usually a person of considerable education. Normally he needs to have been through the kind of education in depth that is given at a university. Such education is expensive, not only because of its length but also because of the increased salary rates subsequently demanded by the teachers. The achievement of maximum reform would therefore take a long time, perhaps thirty years or more, while a new generation of teachers received a much fuller education. It would also involve a great increase in expenditure to attract students of better quality to the teaching profession. This is the ambition of most countries as a long-term program, but such a solution would appear to be impractical for the present.

An Intermediate Objective

Is there any half-way house, less expensive, quicker, but achieving some of the objectives? One idea is to use such media as books, radio, and television to bypass the teacher and bring the more knowledgeable and understanding expert into direct contact with the pupil. By the use of mass media a small group of highly qualified teachers might be made to influence the thinking and attitudes of thousands of pupils all over a developing rural area. Is there any evidence that this approach would work?

Experience of the educational use of radio and television in the developing countries is still meager and, so far, is not very encouraging, possibly because their use within a school system has often been looked on as a side-show and adopted for reasons of prestige, but also because of technical problems, both educational and physical. The experience in the use of books and other written and illustrative material has been more seriously pursued, and in one or two countries has shown promising results. Whatever the media or mixture of media, the educational requirements are very much the same.

In the case of education at the primary school level, they can be stated as follows. A small unit of half a dozen experts on different parts of the primary school curriculum will form the core of the movement for reform. Their task will be to prepare in detail the lessons and supplementary material for all classes in all subjects. Whatever their subject specialities they must work in the closest touch with one another, because each new idea that is introduced must appear, as far as possible, in all the subjects, in order to counteract the common habit of putting new ideas into separate compartments of the mind. Teachers' handbooks must be prepared, containing ample suggestions for experiments, investigations, and practical activities the pupils can undertake. Inspectors will need to be guided on what to look for when visiting classes, and examiners must be given suggestions on how to adapt their examination questions to the new cur-

ricula. So far, no one has managed completely to supplant the class teacher, however inadequate he may be, and at the primary school level I doubt if they ever will. So an important task for the unit is to estimate what changes in ideas, attitudes, and teaching methods they can, in fact, demand of the majority of teachers with any hope of success. Then the new courses and materials must be aimed at achieving this degree of change. To match courses and teaching materials in this way to the abilities of the teachers, the unit will require experimental facilities, preferably in a school or schools under its control but staffed with ordinary teachers. They will need to consult at every stage with experienced teachers, inspectors, and the staffs of training colleges, who will later be involved in training the rank and file of the profession in the new approaches and techniques. For quite an extended period the experts will have to visit a wide variety of schools to check the progress of the scheme, and to make the inevitable amendments to courses and materials that experience will show to be necessary.

Such a program of changes in school practice is not to be undertaken lightly. Perhaps the best way of giving the planner a rough indication of the time and money that will be involved in applying this intermediate method of reform to rural schools is to show some of the problems that will be met. [EDITOR'S NOTE: the following is based on the author's 16-year experience with such a program in the Sudan, discussed in the original pamphlet.]

Expert staff with sufficient background are difficult to find among the primary teachers, and therefore local or foreign staff with experience in secondary or higher education have to be employed, preferably in association with selected primary teachers. The significance of this for planning is that time must be allowed for the experts to get to know children of this age. This they can do through experimental classes, but it is a time-consuming process. Production is also slowed down by the need to follow through an experimental class as it moves up the school. One must think of the project as lasting a decade or more.

If there are frequent changes of experts, the courses on which they are working will change with them, for few experts are happy at taking over someone else's baby. In that case the courses will never be firm and consistent enough to give the teachers the support and guidance they so sorely need. So the expert staff must be made to feel that they have the confidence of the authorities, and that the whole scheme is not dependent on the passing whim of one or two people in high places. Terms of secondment, and also foreign contracts where needed, must be for quite long periods, and provision must be made for promotion within the scheme.

The teachers in the classroom cannot act purely as monitors. The more stimulating the material, the more "come-back" from the pupils. If this response is not dealt with sympathetically and knowledgeably, the brighter pupils will be frustrated and much of the value of the project will be lost. The teacher on the spot has to comment on the children's work, correct it, encourage and admonish, and cope with what, it is hoped, will be numerous questions. The experts can help by giving the teacher supplementary information and notes on the various exercises and the problems likely to arise. They can also try to avoid rousing curiosity which they do not help the teacher to satisfy. But the success of this effort depends greatly on the class teacher's active cooperation. His sympathy must be won and his morale maintained. If they are not (and inevitably there will be some teachers who cannot, or will not, respond) there is likely to be a widespread misuse of the new materials and a reversion to mechanical learning.

Relationships with other education staff, development officers, and the general public are important. In most developing countries the content of the curriculum is fixed by a central educational authority, and school inspectors and the system of public examinations determine very largely what it is in the program of the schools that the teachers regard as most worthy of their attention. Hence the need at every stage for conferences of inspectors, examiners, training college staffs, and head teachers, where their advice can be sought and where methods of relating the new aims to the existing examination system can be worked out. The local development officers must be brought into consultation, not only because they may contribute useful ideas to the curriculum but also because, unless they appreciate the change in attitude that is being attempted, they may well be critical of the first products of the reformed schools. This is particularly likely where development officers are accustomed to having their views accepted by local people and are unused to being asked "Why?."

The general public, no less than the officials, must be made aware of the changes that are taking place in the schools, and of the reasons for them. Parents, as elsewhere in the world, are concerned with success in examinations. They are likely to be suspicious of change, particularly when it involves their children spending time in doing scientific experiments, making things, drawing, and visiting and inquiring into local institutions--all of which, they may think, takes up time better spent on getting on with their reading, writing, and arithmetic. They may be partly reassured if the experts can first show that their methods produce better examination results in traditional subjects. It may also be advisable not to stress the word "rural" but to use some such term as "developmental" to describe the new objectives. The progressive forward-looking elements of the public, impatient for reform but not realizing the difficulties, may suspect

that the experts are spending too much time on experimenting and the testing of their material. There must be sufficient expert staff to cope with public relations. The initial presentation of the plan to the public must be very carefully thought out and their minds prepared for it well before it is introduced on a major scale into the schools.

Finally, there is the problem of ensuring the carryover of the changed habits and outlook into life, when the child leaves school. Where tradition and the authority of older people carry great weight, the young tend to do one of two things after leaving school; either they relapse into traditional ways and conform, or they make a complete break, and, more often than not, leave the district. Some provision for the guidance and support of children in village conditions who have recently left school will be essential. This may take the form of 4H and young farmers' clubs, of radio programs or a youth magazine, as determined by local conditions. Without it, the new program in the schools may be largely wasted.

The costs of the intermediate plan will be by no means insignificant. They must cover the employment of a group of experts, the publishing of textbooks and teachers' guides, broadcasting, in-service courses for teachers, conferences, publicity, and follow-up measures to support ex-pupils. Fortunately, this kind of plan does not involve large, all-round increases in the salary scales of teachers or the considerable costs of giving them a much longer basic education.

The effects of the plan are likely to be patchy, but at least some children will catch the new way of looking at things and most teachers will gain a new sense of purpose. It is essential to regard this proposal as a transitional stage, and not as the final goal of school reform. In the long run, nothing will guarantee work of high quality in the schools, be they rural or urban, without a teaching service that is well educated and well trained.

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Rural Mimeo Newspapers

Robert de T. Lawrence

[Introduction of mimeographed newspapers throughout the Liberian countryside had the following results: literacy programs were stimulated, countrywide news coverage was facilitated, inter-area and -tribal knowledge was increased, and a channel for the spread of developmental ideas was opened.]

When the first issue of the Gbarnga Gbele News was published in 1963 it marked the beginning of a rural newspaper revolution in the interior of Liberia. Within a year there were 30 two-columned, brightly titled, four-page mimeographed newspapers covering the entire country, where none had existed before. Since the level of literacy was about 10 to 12 percent, there were sufficient literates to read the newspapers and to read to others. About 90 percent of the nation's population of 1,250,000 live in the interior, where some 28 tribal groups speak 16 different languages. This presented a problem, but at the same time an opportunity to help overcome it by publishing newspapers in the national language, English.

The mimeograph method of printing was considered the only practicable one, being simple in operation and needing no expensive equipment. Aside from paper and ink, each newspaper required these basic supplies: a standard typewriter, a crank mimeograph machine, a flashlight-powered short-wave radio receiver, and a stapling machine. There was no supply of trained journalists, but editor/typists with a good command of spoken and written English were available. National and foreign news was gathered from a 30-minute radio

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newscast each morning at dictation speed; local news was obtained by the local editors. Stories were short with brief headlines, short sentences and paragraphs, using only easy words.

Starting the Project

The Liberian Information Service (LIS) sponsored the rural newspaper project. At Gbarnga, a centrally located town of about 10,000 population, 125 miles in the hinterland, there was a district headquarters and a small LIS information center. Two men, neither of whom had had any training in jounalism, ran the center, which consisted of a small library reading room, a display board and mimeographing facilities. Fifty miles away at Zorzor was the newly established Rural Teacher Training Institute where teacher trainees from all parts of the country were prepared for their profession, and rural school teachers were given refresher courses. These two locations where educated people were on duty and mimeograph equipment was available were selected for the first two newspapers.

The LIS graphics section in Monrovia prepared the art work for the title headings, one reading Gbarnga Gbele News and the other Zorzor Institute News. Some ornamentation and simple sketch work suitable to the region was included, and 5,000 copies of each were preprinted and sent to Gbarnga and Zorzor to use for their first pages.

At Gbarnga on the appointed day the information center men assisted in gathering news for the first issue. A number of sources were visited, including the District Commissioner's health, agriculture and education offices, and short news items were prepared in the form of single column stories of two to three paragraphs. The people interviewed were enthusiastic about the prospect and were encouraged to submit news voluntarily and regularly to the information center. The regular radio newscasts had been monitored that morning for national and international news and a few items jotted down. However, few of these were used, for in a few hours more local news had been gathered than was needed. As the project developed, indeed, less and less radio news was included because local news was comparatively plentiful and the reader demand for it was strong.

Distribution raised a problem owing to the scarcity of transport in the district, but copies were circulated free of charge to government offices, schools, clinics, churches, stores, tovarious officials and to nearby towns. The first press run was of 300 copies which were distributed by every possible means. Circulation will probably remain a problem for some time to come but it will improve as transport in the interior increases.

The enthusiastic reception of the first newspaper in the area was a considerable encouragement to go forward with the project. The

District officials were pleased to have this new means of communicating with the people in the area. The health and sanitation authorities were glad to have a way of getting across their messages regularly to a large segment of the population. Education advisers and teachers welcomed this type of locally produced material which would promote literacy training. Agriculturalists, religious leaders, women's groups and others began contributing news. Both the Gbarnga and Zorzor newspaper editors were asked to exchange copies of each issue regularly, so as to be able to reprint from each other news articles of interest to both districts. Both newspapers also sent copies of each issue to LIS to be given to the radio stations and to the Monrovia daily newspaper.

Developing a Rural Newspaper System

Valuable experience was gained through starting the two newspapers and it was decided to increase the number and provide a basis of support by LIS to help the new publications survive during their early life. From a target goal of five originally set for 1963, six times that number began publication.

To encourage the establishment of more newspapers the following steps were taken: a) a press release was issued by LIS to the Monrovia newspapers and radio stations describing the project and explaining how simple and inexpensive it would be for other groups in the interior to start their own papers. The release outlined the support that LIS could give. b) The Director General of LIS was interviewed on radio station ELBC where he described the contribution that rural newspapers could make to economic, social and political advancement throughout the interior. c) Field trips were made to mining companies, rubber plantations and to the Booker Washington Institution. Letters were written to others who had at one time shown an interest in newspaper work and where mimeographing facilities were known to exist. d) On two occasions, LIS representatives gave talks to large groups of American Peace Corps volunteers who were about to assume posts in the interior as school teachers.

Within a few weeks, three more newspapers began publication, and ten more were started within three months. As these additional newspapers came into existence the role of LIS in assisting them became clear. Among the steps taken were: a) assignment of a full-time editorial assistant to the project; b) preparation of an 11-page mimeographed set of instructions containing sections on what a newspaper can accomplish, planning for staff, equipment/supplies, gathering news, writing a news story, editing, general publishing information, and advertising/business operations; several copies were sent to each editor. c) An effort was made to minimize costs for printing equipment, paper, stencil and ink supplies; d) two films were secured

for loan to the newspaper staffs. One described the small town weekly newspaper editor in an industrialized country and his role in community affairs. The other showed the motivation and progress that such a newspaper can stimulate. e) More attention was given to tailoring the slowly spoken, early morning newscast to the needs of the newspapers. f) LIS press releases providing a good source of continuing news were sent to each editor. g) Complete files were kept on each newspaper, and if ways of improving the quality of the publication within the capabilities of the editor could be seen he was informed by letter. h) A popular innovation was the offer to editors of a choice of colors for their title headings--reds, greens, yellows and blues, in different shades.

Expansion of the System

Excerpts of general news taken from the rural newspapers and sent to the capital city news media were welcomed and printed under the heading "Around Liberia in Brief." According to the manager of radio station ELBC his office at one point was "deluged" with letters from listeners asking for more rural news. The station manager of ELWA, which also has powerful transmitters covering Central West Africa, wrote, "We at ELWA are vitally interested in these new mimeographed regional news sheets." Although it had not been a part of the original planning of the project, it became apparent that a nationwide system of news coverage had developed. Heretofore, it had been almost impossible to obtain coverage of important events in the interior owing to transport and communication difficulties, and the problem of finding qualified correspondents to gather and transmit the facts accurately.

Realizing the potential of this new reporting system, LIS announced to newspapers and radio stations that reporters were available in the principal towns and would be on call for special assignments. If, for example, an airplane should crash near Bolahun along the Sierra Leone border, the editor of the Bolahun News could cover the story. This development opened up possibilities of a new source of income for the editors. For a story of about 300 words, for example, a fee of about $5.00 could be charged--a nice supplement to the community newspaper budget and sufficient to pay the cost of two or three issues. The full potential of the countrywide correspondents system has yet to be realized, but there is every prospect that it will grow.

Support from Rural Educators

A prominent official in the field of education once remarked that in his opinion newspapers were the most important single educational medium of all, and top Department of Education officials have strongly supported their development. Dr. D. J. Hays stated, "I have been engaged in rural school development in the Liberian interior for 9 1/2

years and consider the community newspapers the most important education implementing device that has been introduced." He also cited the role the newspapers were playing in the process of unification of the numerous tribes with their different languages. In many of the large communities, these newspapers are the only reading materials produced. Two of these new publications were established primarily for their contribution to literacy training, because the interest of their news content provides a strong incentive to learn to read.

Rural Newspapers as Money Earners

For the success of the project, it was necessary that each of the newspapers be self-supporting. Considering their value to community development and education, and their low cost, it would no doubt have been worthwhile for LIS to subsidize them. However, this was not possible, nor was it desirable in the long run so long as they were potentially self-supporting. LIS was able to print the colored title headings and furnish technical assistance without charge, but that was the extent of its support.

It was found that the profit motive more strongly influenced some editors than others. Opportunities varied, of course, some newspapers being more favorably located in large towns with sizeable business communities where advertising and direct contributions were easier to obtain. However, all newspapers were encouraged to build up their sales, advertising and other revenues no matter how small their size or low their cost.

Advertising proved surprisingly easy to obtain, even in the smallest towns. Some newspapers are doing quite well with their advertising income, for instance the Cape Palmas News in which 17 ads at $1.00 each were counted in a recent issue whereas the cost of publishing probably amounted to $2.00 or less for paper and stencils. The editor of the Buchanan Star reported that he was making about $25.00 per weekly issue on ads and copy sales or a total of $1,300 yearly. He is buying his own new mimeograph machine. The community newspaper can be an active stimulant to the local economy as regular advertising increases store sales.

Entertainment and Feature Materials

The average reader seeks entertainment as well as information in his newspaper. A good balance between the two in each issue adds to its popularity and increases sales and readership. Each tribal group has its own body of folklore and legends which have been handed down from story teller to story teller. Now this can be preserved in print. For the most part it consists of colorful anecdotes involving animals, birds and reptiles which in addition to being highly entertaining, con-

vey a moral about truth, honesty and other virtues. This provides a store of feature material on which the editors draw heavily. A book of Liberian proverbs was also compiled and published by LIS for free distribution to each editor. This provides a ready supply of "fillers" simply written for easy reading.

LIS also helped editors to supplement their straight news content by distributing prepared feature materials. These were specially tailored for the needs of the community newspapers and were sometimes tied to anniversaries and special events. For "Flag Day" for instance, a full page article was produced, giving the history of this celebration.

As a result of this experiment, Liberia possesses a nationwide self-supporting rural newspaper system. By printing the local and national news, these newspapers are both creating and expressing public opinion; they are educating the communities and providing a substantial boost to literacy training. They provide an outlet for suggestions for the betterment of rural life, thus stimulating worthwhile activities. They promote knowledge of other communities. It is entirely within the capabilities of any nation, using the resources on hand, to match or even exceed the accomplishment of Liberia.

[Excerpted from Rural Mimeo Newspapers: A Guide to the Production of Low-Cost Community Papers in Developing Countries. Paris: United Nations Educational, Scientific, and Cultural Organization, Division of Free Flow of Information, Reports and Papers on Mass Communication No. 46, 1965, pp. 7-12. UN Document No. MC. 66. XVII. 46bA.]

[NOTE: The original UNESCO publication from which these excerpts were taken includes extensive instruction in how to organize this type of rural publication.]

Education and Economic Opportunity in Africa

Guy Hunter

[African countries are educating more people with higher levels of expectation than can be accommodated by present economic opportunities. The system is overly oriented toward its limited top level. Development requires, inter alia, more emphasis on educating adult producers and sub-university technicians, more attention to primary school-leavers and greater reliance on private resources.]

In all societies all children are educated, whether by schools or by parents. Schooling becomes essential when techniques become more specialized, when the opportunity to earn a living depends on learning them, and when parents can no longer impart them. It might be supposed, in a virgin world, that economic opportunity would come first, that this would create the need for corresponding education, and that there would thus be work for those who learned the new techniques. But in developing countries today the volume of economic opportunity (beyond that requiring only unschooled assimilation) has been far, far smaller than the labor force.

Because formal education has acquired a worldwide value, independent of opportunity, and because in the very early stages of its extension in developing countries it does give a few people great rewards, it has expanded far beyond the present opportunity to use it. More and more children receive some education, but not enough to reach the receding threshold of qualification for the modern sector; what education they receive may well lie unutilized and largely irrelevant to the only life open to them. The essential problem in these coun-

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tries is to establish a relationship between education and the great needs of society.

The growth of African education can be best described at two levels, which have been expanded for different reasons. The top level--the university and the secondary schools--has been expanded to provide high-level manpower for all economic and social purposes; since it is replacing Europeans, the rate of output has to be much higher than the eventual rate for maintaining an African service. The bottom level--primary education--has been expanded for three main reasons. First, from popular political pressure. Sometime in the late 1950s in East and Central Africa (earlier in West Africa) parents became convinced that education was a necessary passport for a paid job. Although it is now very largely an illusion to believe this unless the child reaches secondary education, the pressure continues. Second, it was expanded because education was felt by some to be a human right--a right, be it noted, which has to be financed. Third, it was expanded in a belief that there would be an economic payoff--that an educated population will be a productive population; a true proposition only if there is economic opportunity for productivity. Education may be a necessary condition for economic growth; it is certainly not a sufficient condition.

As a result of this history of educational expansion, Africa today has a relatively small group of men and a few women with secondary or higher education, almost all of whom have jobs carrying an enormous differential above average earnings--a graduate will start at £750 or more per annum [£1 = $2.40]. In the less educationally developed countries, this group may represent about 3-5 percent of a single age group of children. In education, as in so many other respects, Africa is being developed from the top down, and there is only room for a few in the developed section of salaried employment. The remaining 95-97 percent will either have no education at all (as much as 45 percent or more in such countries), or four years only (say 30 percent), or a full primary course (say 20 percent). In the more developed countries--Ghana or Southern Nigeria--the proportion entering and completing primary is much higher; but as wage-paid employment is equally scarce and as the output from secondary is also larger, the proportion of those with a full primary education who are unemployed is correspondingly higher.

In brief, a very small proportion of children are getting a very expensive education and will get a good job to follow it. Over 40 percent are getting no education at all. More than 50 percent are only getting partial or full primary education, of whom few will find paid employment of any kind. But the total of employment is not the total of economic opportunity, since for that we must add in the really successful self-employed farmers. It is this opportunity which could well be expanded.

The process by which this situation has been reached has been bitterly criticized, at both levels. As to the top level, it is said that both secondary and university education have been too academic, élitist, extravagantly expensive, unrelated to African needs. As to content, there is much in this criticism, but if it is taken to relate to quality, I do not share it. It was, I believe, essential that African universities should produce a small number of graduates fully the equals of any graduates in the world. Only thus could any African meet his opposite number in the international world--biologist, historian, mathematician--on equal terms; only thus could the real values of the developed world be grasped at their source. The indulgences of a new culture--the cinema, alcohol, the juke-box--will be picked up easily in any case: it is vital for at least a few to pick up its best values. In any case, it was psychologically and politically necessary; independent Africa would never have tolerated restriction to second rate standards.

But a small provision of the highest quality is enough. Unfortunately, the development of a dualistic economy, and all the temptations to add specialisms and complexity to the modern sector have been leading to a growing pressure to multiply universities, at enormous cost. The cost per place, e.g., in Kenya, is roughly £5 per pupil per annum in primary, £125 in boarding secondary, £950 in university college and to these costs must be added the high cost of new university buildings. The reasons for some restriction are, I believe, decisive--the needs for other types of education are more urgent.

Both the nature and the expansion of primary education have been criticized for two main reasons. First, it is said to be too academic and literary, not preparing the child for the real environment in which he will live. Second, since there is no manpower requirement for more primary pupils in the wage-paid sector--indeed, there is a huge surplus--further expansion might be regarded as both costly to the state and frustrating to the individual. It is vital to keep these two criticisms separate. The syllabus certainly needs revision, though there are fairly narrow limits to what the first few years of education can achieve. But it is certainly not responsible for unemployment, nor can it cure it; the culprit here is the lack of fruitful economic opportunity, either for a self-employed farmer or for those who seek other employment. No conceivable revision of the primary syllabus could greatly affect this situation, and no one would suggest revising it in order to fit a child for a highly unproductive life on his father's subsistence holding. The first step must be to reform production and to fit education to the real demands such a reform would make. To create rising expectations and then frustrate them is certainly not defensible.

These criticisms in their current form, however, do not provide any really helpful standpoint for assessing future policy. More educated men and women are needed at the secondary and higher level in

Africa, as the present need for foreigners at this level witnesses. Since the present pattern of university education is small and expensive in its output, the tendency is to think of downgrading the university in quality, multiplying its output, and changing its content towards more applied studies, especially in science and technology. This would certainly seem to be a way to get the worst of both worlds--a larger number of less qualified graduates who will expect just as high rewards and disdain the work of a technician. The trouble is that the prestige of "the university" has obscured its real function, which must be defined more closely. Equally, revision of the primary syllabus will not cure the unemployment problem, and an attempt to restrict primary education without putting something in its place is politically dangerous.

Imported Models

This situation has been caused by the importation of a European (mainly British or French) tradition of education followed by a confused reaction against it, in which one part of an American tradition has recently been slipped in as a corrective. In the older European tradition, within a highly hierarchical society, university education had as its chief function to produce rulers. Later, the industrial revolution in Europe had other requirements: and in England at least a quite different kind of education grew up from below for those entering the new productive trades--mechanics institutes and the foundations for the modern Technical Colleges. While a series of compromises between these two worlds of education has been (imperfectly) worked out in Europe, two other civilizations made a far more outright transition to the new role of education as the handmaiden of a technological economy--the United States and, even more single mindedly, Soviet Russia.

It is no wonder that Africa turned toward this modern conception--more toward America than Russia because of earlier contacts and more financial aid. Africa had been equipped with British or French universities which carried a strong touch of their old emphasis on civility, the arts of government, the Faculté de Droit, literature. Below this pinnacle was established a system of primary and secondary schools which looked reverently upwards to it: neither primary nor secondary were consciously planned as terminal courses. It was this system which, at the time of Independence, was called upon to be the executive tool of manpower planning, to equip African societies with practical men at all levels to tackle the administrative and technical tasks of development. It was not well suited to it. The practical functions had already been developed mainly inside government--the Departments of Agriculture, Health, Works or Engineering, and the corresponding training courses were governmental too. In the somewhat confused adaptation which has lately been going on, the university has been in an ambiguous position. Many of the newer foundations, desperately

anxious not to be remote and ineffectual, heavily influenced by the much-advocated American Land Grant College, have been americanizing fast, considering Departments of Domestic Science or Journalism. In a few cases the utilitarian Soviet model has had some influence. The universities are trying to lean down from their embarrassing height to find useful tasks of training within an African society and economy which offers only limited scope for work at the traditional British "full university level." The existing structure of the school and governmental system has been scarcely altered.

It is always difficult to adapt ancient and proud traditions, and undoubtedly some of the difficulty has arisen from keeping the magic name of university while demanding such multifarious functions, both old and new, from it. But the difficulty goes deeper than names. Both the American and Russian systems were built in societies much more educationally and economically advanced. The Russian system was particularly geared towards industry, in an authoritarian society which had no time for patient education of a land-owning peasantry. The American system reflects a society so rich that, in its huge array of university and college institutions, it can afford both the most advanced research and scholarship and popular courses in a host of minor vocations and hobbies. Neither of these models fits African needs. It is clear that only a redefinition of these needs, in relation to education and to the economy, can point to a more hopeful way forward.

What are the Developmental Needs?

Africa, seeking to catch up--as was Soviet Russia--and seeking to develop a continent, must clearly lean to the "practical" definition of education; but there are other needs, in administration, politics and the study of society, to which education has an equally vital contribution to make. The question is to define the levels and institutions through which each of the needs can be met. The economic need is to develop the greatest resource available--the land--and to bring into this development a far greater proportion of human resources at a humble level. What are the tools to be used?

Education will be the chief one; but, especially in the early stage, the education of the adult, the producer; and this requires effort at every educational level. At the top level it will require the best that a good university can produce within the whole range of biology, the physics and chemistry of water and soil, agricultural and irrigation engineering, with a strong element of farm economics and sociology. While some university graduates should be field officers, the massive effort in the field could well come from a sub-university level, which for simplicity I will call a College of Rural Technology. Large enough for economies of scale, recruited from secondary schools, teaching not only agriculture but survey, farm accountancy, coopera-

tive organization, farm mechanization, in courses of varying length essentially aimed at a thoroughgoing practical training--such institutions would provide the technicians for the whole rural development program, with a strong interdisciplinary element in their training. A vital corollary would be to offer to all of them a career structure widely overlapping the scales for university graduates, by which outstanding performance in the field would be richly rewarded. This middle level is essential to success at the lower level. It would certainly demand a large share of even an expanding secondary-school output, thereby, incidentally, relieving pressure for expansion of the university.

At the third level would come the application of educative effort to the farming family and the rural community as a whole. For the time being the priority would not be on the primary school for children but on the adult producer; an effort to create a modernized, productive rural economy which could use the primary school output and to which an intelligent terminal primary course could greatly contribute. The staff and institutions which correspond to this effort are the Extension Service (which would also need to use trained post-primary assistants to avoid wasting second-level staff), the Farmers' Training Center, "evening" classes in commercial, technical, and general education, functional literacy, cooperative training, craft training of an exceedingly simple kind--even, in the dry season, the (Danish) Folk High School. The essence of this whole program would be a clear development orientation.

If the educative effort to adults succeeds, backed by the necessary inputs of credit, equipment and material, then the primary school will be called to adapt children to a productive environment. It will give skills, in language and simple mathematics particularly, a wider vision of the environment, perhaps a more scientific account of the natural world. But, at the primary stage, it cannot teach modern agriculture; and in many areas it would be useless to try because the opportunity to practice it has not been prepared. This last proviso is important: the rural economy has got to show signs of life before a new effort in primary schooling can succeed. Africa is strewn with excellent attempts to give primary a rural bias which have failed utterly because rural life is unreformed, unproductive, unattractive, or seen as mere drudgery from which to escape. It is for this reason, and this alone, that a pause in primary expansion, while funds and efforts are poured into adult producer education, is justifiable.

Finally, there is a type of education which is always apt to be neglected because it does not fall within the school system and is often looked after by many different departments. This is post-primary training for those young people--including 90 percent of primary school-leavers--who do not enter secondary. This is the age group 15 to 18-plus, a group whose opportunities are actually being reduced

because the entry qualifications for training are constantly being raised as secondary output increases. For these young people, many of whom will not have had any schooling, the Young Farmers' Club, National Service, organized farm apprenticeship, and (for the better educated) the "evening" class in craft or simple commercial training could make an immense difference. If they are neglected, a few years of hanging about aimlessly, doing short casual jobs, living off relatives in town, selling vegetables to passing motorists, can make them almost unemployable. This is not only a waste of the investment in primary schools: it is a much more costly waste of human energy and responsiveness. A day will come in Africa, in the richer African countries sooner than elsewhere, when every child of 14 or 15 who does not go into a grammar-school stream will get some post-primary educational activity. To prepare for that day far more widespread experiment is needed, to find the best methods to train the leaders and teachers, and also to mobilize voluntary or part-time effort, since a program on this scale will have to be done with minimal cost to public funds.

Further Choices

This rough sketch of an educational policy which might match up to the needs of a rural revolution leaves unresolved several of the most difficult choices which face governments with limited funds. Even if primary expansion can be slowed down a little--with population growth it has to expand annually to keep the same percentage of an age group entering school--there are constant problems of priority. For example, should the limited funds for expansion of primary be used to offer four years of education to children who now get none at all, or to add three years to existing four-year schools? Should priority in expansion be given to those areas of higher agricultural potential where more education is most likely to be needed and used? The brutal economic answer might be to concentrate on seven-year education (with its opportunity to enter secondary) in the most hopeful areas, and leave the rest on a "care and maintenance" basis of the minimum provision which politics will allow. The arguments from equity, and from the random distribution of intelligence, could point to a maximum extension of four-year education; where education is free, why should some have seven years and others none at all? Indeed, it could well be argued that, in richer areas, parents should finance the fifth through seventh years, while in poorer areas public funds should make a heavier contribution to find the buried talent. Again, is the expense of four years' education wasted? If children are abandoned by the educative system at age ten or eleven, will they be capable of entering the youth program at the age of fifteen?

There is no substitute in a modern society for some schooling at least from seven to fourteen. If all who entered primary got a real chance of advance, equity would demand a fair opportunity for all, but

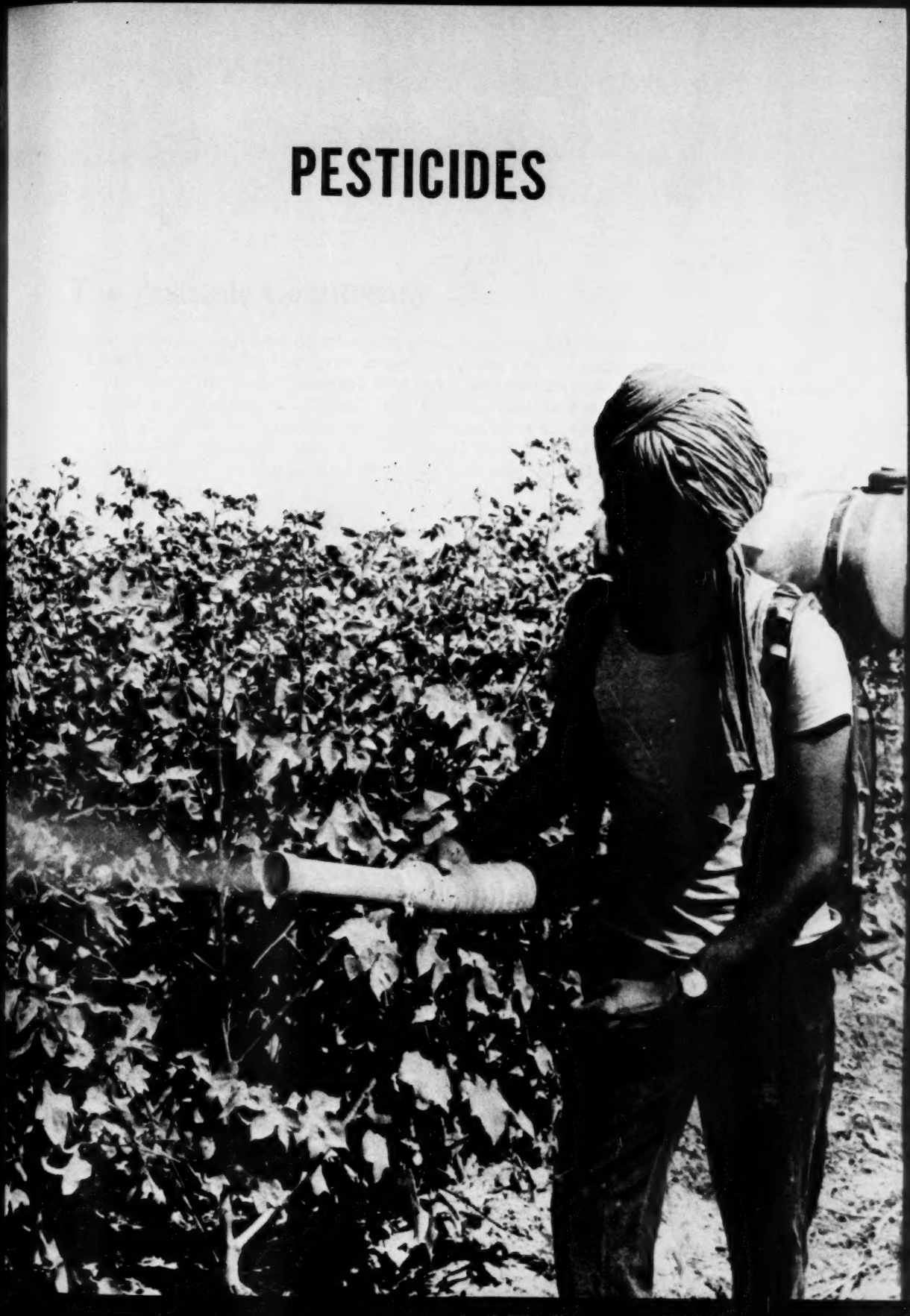
this is simply not the case: the chances are minimal anyway. Moreover, the African child, in those great areas of the rural economy where little or no modernization is taking place, is not desperately distressed to miss school or leave it early. Such children will grow up in the family and community, perhaps no better but certainly no worse than their parents, without greatly missing an opportunity they never knew. It is the children who have had seven years of schooling who suffer most disappointment. This recognition of the necessities of the situation suggests that the "brutal" economic answer is in fact the more sensible. Where rural development is really beginning to hum, where agriculture is getting more technical, employment growing, parents earning more, then the full primary course and follow-up at the "youth" stage becomes far more necessary. It becomes also more useful, and the lack of it is more missed by parents and perhaps by children too. Where society is still largely traditional, opportunities few, and expectations not aroused, the first priority is not more schooling for children but the creation of opportunity followed by education of the adult community to grasp it.

Private Financing

This discussion has tacitly assumed state responsibility for financing education. But this assumption, where it leads to education being given free, both complicates and restricts educational policy. When there is too little public money to go round, the state is forced to discriminate, and this is both invidious and apt to distort policy. It restricts coverage, because the potential contribution of parents is not called upon. Where African parents really want education for their children more than consumer goods, and are prepared to pay for it, there is surely a major source of small savings which cannot be neglected. The state can usefully intervene to prevent commercial enterprise exploiting parents by providing bogus and expensive schools. As African societies develop, the need for more varied opportunity--correspondence courses, commercial colleges, radio-classes, training financed by community self-help--will grow constantly. Certainly it will lead to some new forms of social inequality--the successful father will more often pass on success to his son--but probably no greater than the restrictive, organized inequality which the chances of access to state schools now involve. It is vital for African education to come out of its narrow shell of government provision directed towards a narrow range of manpower needs.

[Excerpted from The Best of Both Worlds?: A Challenge on Development Policies in Africa. London: Oxford University Press, 1967, pp. 96-113 and p. 116. ©1967 by the Institute of Race Relations, London.]

PESTICIDES



SPRAYING COTTON WITH PESTICIDE, INDIA
(PHOTO: FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS/D. MASON)

The Pesticide Controversy

[The widespread use of certain chemicals to kill insects and other pests has recently led to intense controversy in some countries on the importance of their harmful effects. Moore describes their ecological impact and its implications; the Conservation Foundation discusses possible harm to humans and other disadvantages; Vicker, however, argues for continued use of DDT until better substitutes are found. Brody describes the actual decrease in use of DDT in the U.S.]

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The Pesticide Age

The discovery of organophosphorus insecticides, the discovery of the organochlorine insecticides DDT and BHC, and of the growth-regulating weed killers, all in the second World War, led to a revolution in the fields of preventive medicine and agriculture in the years which followed. The rapid growth in production and use of herbicides, fungicides, insecticides, rodenticides, etc., which today are known collectively as pesticides, was phenomenal. The value of these pesticides was and is enormous; they have saved millions of lives and greatly increased food production and reduced the waste of stored food; but like all technological advances, they have brought new problems as well as solving old ones, so that today, at least some people believe that the disadvantages of pesticides may even outweigh their advantages. On the debit side, pesticides have created new pests, they have destroyed millions of organisms which are harmless or valuable to man, and, for the first time, chemical substances used as poisons have become global contaminants. How has this come about?

For practical reasons the farmer tends to think of a pesticide as if it were a medicine administered to his crop. This view is a totally unscientific way of con-

sidering what actually happens when a pesticide is used. Unfortunately, no pesticide is specific to the pest against which it is applied. Different species vary greatly in their response to the same chemical; every pesticide application will result in the death of numerous organisms other than the pest. Pesticides are bound to affect the whole ecosystem in which the crop and the pest are living--i.e., the various animals, insects and plants which provide food for one another so that all continue to coexist in the same place in an intricate population balance. Even the simplest ecosystem contains many species of plants and animals. So great is the complexity of all ecosystems that very little is known about the causal factors within them; therefore, whenever a spray is used it is being applied to a system which is very imperfectly understood.

There are many types of effect which occur when a pesticide impinges on the population of a species. First, there are the toxicological effects--a proportion of the population will be poisoned. Others will suffer sublethal effects, which may make them more susceptible to other deleterious factors, or may affect a future generation by impairing reproduction. Some toxic effects can be delayed, as when a predatory animal is poisoned by obtaining amounts of a persistent insecticide which have been accumulated by the prey animals on which it feeds. Secondly, the normal balance of ecological relationships, for example, those between competing species and between prey and predator, are likely to be upset when the different organisms in the ecosystem vary in susceptibility to the pesticides, as they always do. For example, the mosquito Anopheles hispaniola and three other species benefited at the expense of Anopheles labranchiae when Sardinia was sprayed with DDT in order to eliminate malaria. Indirect ecological effects of pesticides have had important economic consequences, for example, large sums of money now have to be spent annually in order to control red spider mite and related species. Before pesticides were used extensively, these animals had been adequately controlled by predacious mites and other wild predators; but non-selective sprays have reduced the populations of the latter to such an extent that those of the red spider mite were released from normal control and so became pests.

A New Environmental Situation

All pesticides are liable to produce problems, but since most such substances are "broken down" (i.e., the chemical components change) quite rapidly into harmless metabolites, these effects are usually local and transient. The power of recovery of most ecosystems is strikingly great. However, organochlorine insecticides produce quite a different sort of problem because they are both highly persistent and soluble in fat. These characteristics enable them to spread outside treated areas and to accumulate in the bodies of animals and hence in food chains. For example, a worm will eat fallen leaves of a tree

sprayed with pesticide; a bird will eat many such worms; in time, enough poison can be concentrated in the bird to kill it. Persistent organochlorine insecticides have been detected in the component parts of all the major ecosystems: on land in soils, plants, insects, birds and mammals, and in rivers and the sea in muds, water, fish and fish-eating birds and mammals. Many vertebrate animals have been analyzed for these chemicals and nearly all of them have contained detectable amounts of DDT and its metabolites and of dieldrin; many also contained mercury, heptachlor epoxide and isomers of BHC. The specimens have contained pesticides even when they were obtained from remote parts of the Arctic and Antarctic. Therefore, there is today a totally new environmental situation--practically all life on the earth is now in contact with synthetic organic toxins. The extent to which these substances are having effects depends on the amounts obtained by the different organisms; the quantities in rainwater and the sea are extremely low and in some cases are undetectable; they are extremely unlikely to have biological significance as such, but pesticides at these very low levels can be significant if they become concentrated by living creatures.

In general, the animals which have obtained the largest amounts of persistent compounds belong to two classes: first, those animals which live in sprayed areas and so receive large doses directly or by eating heavily contaminated food; and secondly, predator species at the ends of food chains. Local casualties may be considerable but they do not appear to have caused serious damage to most species. However birds of prey, especially those which feed on other birds, such as the peregrine falcon and sparrow hawk, have been very seriously affected by acute toxic effects. In addition, organochlorine insecticides have been shown in the laboratory to produce a number of sublethal effects on birds, including the thinning of eggshells, delay in ovulation, histological changes in the thyroid and effects on steroid hormones. At least some of these effects, notably the thinning of eggshells, have occurred widely in the field in the United Kingdom and the United States and elsewhere. In some cases there is good evidence that the sublethal effects have caused, or could cause, population declines quite apart from those due to acute effects.

Economic Damage

Thus far, several species of economically unimportant birds of prey in the northern temperate regions have been seriously affected by persistent organochlorine insecticides. The existing levels of organochlorine insecticides in many animals, including very sensitive freshwater and marine species of invertebrates, strongly suggest that a moderate increase in contamination by these substances throughout the world could put many species in jeopardy, including those of great economic importance; for example, the food organisms of commercially exploited fish. (This has already occurred locally, but not for

a whole species.) Thanks largely to the studies on birds of prey, the world has been alerted to great potential dangers.

Wildlife Conservation

Today, due to the rapid increase in man's population and to new technologies, the wildernesses are rapidly disappearing, and under intensive agriculture farmland is becoming less and less suitable for most wild species. In the past we had wildlife without planning for it, but very shortly we will only have it if we plan to conserve it, in other words, if we spend money on it. This is forcing conservationists to clarify their aims and to attempt to define the value of wildlife. In practice wildlife is conserved for a variety of different reasons--as a source of food, for greater efficiency in agriculture, for sport, for scientific and educational reasons, for attracting tourists from other countries, and for the immense pleasure wild plants and animals give to peoples of many countries and cultures throughout the world. As man becomes more numerous his appreciation of his environment and of other species tends to increase, and he becomes more aware of what he may lose. Implicit in all conservation practices is the attempt to maintain biological diversity for the present and the future. Conservation is one of the few activities in which specific actions are undertaken now on behalf of future generations.

International Aspects

The discovery that organochlorine insecticides had become global contaminants, and in the case of a few species were already harming populations over very large areas of the earth's surface, showed that the earth's biological resources could be affected by unconscious pollution as well as by conscious exploitation. Widespread interest in pollution problems became particularly manifest in 1969. It is extremely encouraging that an increasing number of governments are concerning themselves with research on pesticide and other pollution problems and with action to prevent damage in the future. Also, throughout the world people are beginning to realize that pollution problems must be tackled internationally as well as nationally. There is a welcome discussion about these issues in the great international agencies such as the Food and Agriculture Organization of the United Nations (FAO).

The needs of different countries, however, vary greatly. Whereas some countries can restrict the uses of DDT and dieldrin for the benefit of themselves and the world community, others cannot possibly do so until adequate substitutes have become available. Nevertheless, much could be done now to increase the efficiency of pesticide use and to decrease avoidable damage; much is already known, but the information is not always available to the people who most need it. New pests and resistant strains of old ones are being produced unneces-

sarily as a result of unscientific crop protection. Endrin, a compound which is exceptionally toxic to fish, is still being used in rice fields where fish are an important source of protein for the local inhabitants. Effluents containing appreciable amounts of pesticides are still being discharged into rivers and the shallow seas which also support important stocks of fish. The reasons for all these different forms of misuse are obvious--the excessive zeal of some chemical salesmen, inadequate labelling of some containers, some complacency among national and local authorities and sheer ignorance. Some of the developmental problems are more radical. For example, it does not pay industry to look for and market specific pesticides, or to study new methods of integrated pest control, when these reduce the amounts of pesticides sold, and therefore reduce profits. So, only governments can sponsor adequate research on specific pesticides and effective integrated control. Much remains to be done before we can obtain the most efficient use of the pesticides which are already available.

[Excerpted from "Implications of the Pesticide Age: Complex Ecosystems are being Polluted in the Name of Progress," Ceres. Rome: FAO, Vol. 3, No. 3, May-June 1970, pp. 26-29. Reprinted from Ceres, the FAO Review.]

Two. . . . . The Conservation Foundation, Washington, D. C.

Some Dangers in Use of Pesticides

The weight of expert opinion currently holds that humans are not directly harmed by careful use of pesticides. There is apparently no solid evidence of such harm. But practically every human accumulates some pesticides which, as in birds, are stored in body fat. In the U.S. the average is thought to be about 10 to 12 parts per million; in some countries it is apparently much lower, in some much higher. Scientists believe that man manages to get rid of pesticide accumulations over a certain level, given a reasonable amount of time.

Research on the long-term effects of pesticides on humans is virtually impossible; and it is extremely difficult to extrapolate research on animals to humans. So while there is no convincing evidence that pesticides seriously damage man, neither is there proof that they don't. In fact, there are ominous signs that some long-term surprises lie ahead. Some examples:

A number of scientific studies have linked pesticides and other chemical compounds with cancer. In April 1969, the National Cancer

Institute released an interim report on a study of long-term toxic effects of 102 pesticides and 19 industrial compounds on mice. It was found that 11 of the compounds--including DDT and three other insecticides, five fungicides and one herbicide--produced a "significantly" high incidence of tumors. The report cautioned that there was so far no way to relate the findings to man, but the studies will continue. Other reports suggest that pesticides are a genetic hazard to man, capable of producing mutations, which are usually harmful. For example, Dr. Osny G. Fahmy of the Chester Beatty Research Institute in London says, "the amount of pesticide chemicals man is now absorbing from his environment is enough to double the normal mutation rate." He says they are capable of disrupting the DNA molecule; the effects are cumulative; and the mutations may not show up for generations. Dr. M. Jacqueline Verrett, of the U.S. Food and Drug Administration says such chemicals can cause birth deformities in chickens. According to Dr. Richard M. Welch, a pharmacologist with the U.S. drug firm Burroughs Wellcome & Co., sex hormones in rats are affected by enzymes activated by DDT, and the same hormones are found in man, whose residue of DDT is "within a range" to produce the same effect.

Very little is known about the possibilities of "synergistic" effects when different pesticides interact in man, or when a pesticide interacts with a medical drug. Tests have shown that a pair of chemical compounds acting together may be more than 100 times as toxic as either one alone. Since the symptoms of pesticide poisoning are likely to be common to other diseases, diagnosis is difficult. Stanford University's Dr. Joshua Lederberg speaks of the way in which DDT and other compounds cause changes in the metabolism of the liver, adding that man "can therefore be expected to show a changed reaction to a number of other chemicals and drugs, even under conditions where the DDT alone shows little toxic effects. The long-term effects of such combinations are poorly understood." None of these scientists claims to have proved any mass dire effects due to pesticides. But they are warning man that he should not be blind to the possibilities.

More obvious are the effects of pesticide poisoning in household, occupational and industrial accidents. "Each year," says a U.S. government study, "approximately 150 deaths are attributed to misuse of pesticides in the United States. About half of these occur in children who were accidentally exposed at home." It would be impossible to guess the number of non-fatal poisonings, but cases of occupational poisoning have become more frequent. In California in 1964, there were some 1,328 reports of occupational disease attributed to pesticides and other agricultural chemicals. In Mexico, 17 were killed and some 600 made violently ill in 1967 when parathion contaminated bread supplies.

Aside from misuse and danger, the application of pesticides is likely to be fraught with irony and paradox--in fact, with failure. In the first place, it should be noted that the development of agriculture has tended to spread single crops over larger and larger areas, sometimes over thousands of acres. Such monoculture is efficient and economical. But it is also an invitation to pests which thrive on a particular crop, especially since their natural enemies may no longer find the area to their liking. Such invitations, of course, have been answered with massive invasions of pests.

Perhaps the greatest irony in pesticide use is the destruction of beneficial insects and rodents in addition to the target species. Thus the victims are likely to include the natural enemies which have been holding the target pest in check. There are many cases in which pest populations have burgeoned anew as a result. Sometimes the destruction of parasites and predators simply clears the field for a surge of several new crop pests, compounding the problem of control.

A second irony is that pests have a perverse tendency to develop resistance to the poisons man lavishes on them. When a pest population, reproducing rapidly, is exposed to a lethal chemical, the laws of natural selection are dramatically demonstrated. The variety of genetic makeup, even within a single species, means that some insects in the population will have a biochemical mechanism for resistance. The resistant insects which survive will be those which reproduce in the next generations. Then there is an inclination to increase the dosage, or shift to another, perhaps more poisonous chemical, to kill off this tougher breed. But there appears to be no toxicant powerful enough to kill every member of a large population.

There's another kind of "resistance." For example, Professor Walter Ebeling and Donald A. Reierson of the University of California at Los Angeles write of cockroaches that learn to avoid areas covered by hazardous insecticides even after the first contact, with the result that the most toxic substances may be the least effective.

A further problem, even when spraying is done carefully, is drift. Winds frequently carry a pesticide many miles from the target area, fouling another's land. Thus, alfalfa and other crops have often been inadvertently contaminated, and many a dairyman has had his milk barred from the market because its pesticide content was too high.

There is a similar dilemma because many crops and orchards depend heavily on bees to pollinate them. But, says Ward Stranger, extension apiarist at the University of California: "Honey bees are exposed to a great variety of pesticides.... Approximately 19 percent (76,000 colonies) of California's bees used for pollination were killed by pesticides in 1967. This is more than twice the kill reported in

1963. In addition, hives of bees are damaged to such an extent that they are no longer productive or effective pollinators." Thus, one farmer's meat may be another's poison.

[Excerpted from Part I, "Some Not Very Well Calculated Risks," Pollution by Pesticides. Washington (D. C.): the Conservation Foundation, 1969, pp. 7-11.]

Three. . . . . .Ray Vicker is with the London (England) Bureau of The Wall Street Journal.

The Case for DDT

Opponents of DDT in the current campaign seem to have lost sight of the fact that all pesticides have some adverse qualities. One hears dire tales about DDT, how it paralyzes fish in lakes, how it flows to the sea where it kills plankton, how bird life suffers from it. Little is said about how DDT saves millions of human lives through the World Health Organization (WHO) anti-malaria program, or how DDT helps farmers in developing lands to control crop-destroying pests.

In India alone, DDT helped reduce the incidence of malaria from 75 million to five million in a decade. In the Indian subcontinent, insects eat 15 to 30 percent of all farm crops each year. "Do we save the lives of birds or the lives of human beings?" asks Ernst W. Nagelstein, a consultant to the United Nations. "It's true many birds will never sing again if the use of pesticides isn't brought under control. But, millions of human beings won't live to hear the songs of birds again if chlorinated insecticides are brought under a total curb." DDT, of course, is the main chlorinated insecticide.

The campaign against DDT certainly raises some profound questions among people who know the problems in developing countries. Do people in developing countries understand the issues involved? Can adverse effects of pesticides be minimized without banning their use entirely? How can research in these problems be conducted so as to focus attention on requirements of developing nations rather than upon ecological fears of developed countries?

Such questions suggest ways of introducing sanity into the current hysterical campaign against DDT and related compounds. First, it would appear that indiscriminate attacks on pesticides should be resisted by developing nations. Second, the situation should be publicized in developing nations so that citizens understand what is involved. Third, integrated pest control techniques should be promoted to minimize adverse effects of chemical residues. Fourth, research into

problems of developing nations should be supported wholeheartedly, with these nations playing a more vital role in that research.

Attacks on the chlorinated insecticides by the ecological crusaders may superficially seem righteous and worthwhile. DDT indeed is a persistent and powerful chemical. After being sprayed on crops and habitations, it filters into soil or water to remain effective for months, a potent killer for many insects and minute forms of life. But, it is this very persistence coupled with its effectiveness and low cost which makes DDT and other chlorinated compounds so valuable in developing nations. The United States President's Science Advisory Committee of 1965, for instance, reported that for every American dollar invested in pesticides for crop protection, farmers in the United States saved between $4 to $5 worth of crops. No comparable figures are available from developing nations. But, it might be well to note that most of these nations lie in the tropical and equatorial belts where insects are more serious a problem than in the United States; therefore, benefits of pesticides to developing nations are probably far greater.

In the public health area, DDT's benefits are even clearer. "DDT has been instrumental in controlling some of the most important vector-borne diseases of man," says Dr. M. G. Candau, Director General of the WHO. "The concept of malaria eradication rests completely on its continued use. Limitations on its use would give rise to grave problems in the majority of developing countries."

DDT sprayers make door-to-door canvas in WHO anti-malaria program, Latin America. (Photo: Pan American Health Organization.)

DDT costs about 15 American cents a pound and is easy to apply. Most suggested substitutes cost a dollar or more a pound. Checks with chemical companies in Europe and America such as Britain's Imperial Chemical Industries and Fisons, Ltd., the Federal Republic of Germany's Bayer, America's Du Pont and Switzerland's Geigy indicate that no cheap and effective substitutes for DDT are on the horizon. It costs a company $3 to $5 million and five to seven years to develop a new chemical compound. This means that chemical concerns concentrate on those items which offer the best prospect for a profit return. Of course, there are substitutes on the market now, provided that people are willing to pay the price. Many a farmer in Mexico, India, Brazil or other developing countries does not have the money to make such shifts.

The ironic thing, too, is that many of these substitutes are much more dangerous than DDT. Certainly, the compound under some conditions can be harmful to rats, to birds and to other forms of life. It could be harmful in some ways to humans. "To date, there is no evidence, however, to indicate that DDT is dangerous to humans," says Dr. Frank C. Lu, chief of the food additive section of WHO. Not so with one suggested DDT substitute, parathion. This compound is so deadly that mishandling can cause catastrophe. In Algeria, so many people were dying through such mishandling that the government banned use of the chemical in agriculture. It might be well to note, too, that packaging of many chemicals has descriptions and explanations written in English, German or other languages of developed countries. Moreover, in many developing nations, the man who might use the pesticide may not know how to read even in his own language. Thus, it is imperative that any DDT substitute be not only inexpensive but harmless, or relatively harmless, to human beings, too.

One might conclude that developing countries should ignore the campaign against DDT in developed countries, and everything will be all right. That attitude overlooks some commercial and political facts of life. The banning of DDT in industrial nations can be expected to lead to more stringent inspection of foods coming into these countries. Developing countries continuing to use DDT may then find their food exports increasingly discriminated against. There may also be political consequences. Authorities in rich countries will be telling their farmers that DDT is dangerous and must be avoided. Yet, in developing lands, farmers will be using those same pesticides. In such a situation, many people in developing countries may ask the question: If DDT is bad for people in rich countries, isn't it bad for us, too?

Even if there were no campaigns against DDT, the search for substitutes should be much further along than is the case. Many insects are developing resistance to DDT. "Resistance is the greatest single barrier to the completion of eradication programs and to the maintenance of continuous control in the field of public health pests," says Dr. Rajindar Pal of India, a biologist with WHO. He believes that the only practical alternative is the development of new insecticides that are both safe and cheap.

The ideal situation would be for DDT to be phased out over a period of five or ten years, while intensive research is devoted to finding substitutes. This research is so woefully inadequate at the present time that some foreign aid experts feel a crash program should be launched. Such a program could call for creation of an international consortium to finance a pesticide research effort. Major industrial corporations in developed lands are becoming increasingly aware of their responsibilities toward developing nations. Undoubtedly, support from some of these companies could be enlisted in a crash program to find new and safer pesticides which also would be cheap.

Such corporations might be induced to establish manufacturing facilities in developing countries so that these nations will have better control of the pesticides they actually need.

[Excerpted from "The Case of DDT: It Shows the Need for an International Non-Commercial Crash Program of Pesticides Research," Ceres. Rome: FAO, Vol. 3, No. 3, May-June 1970, pp. 30-32. Reprinted from Ceres, the FAO Review.]

Four. . . . . .Jane E. Brody is with The New York Times.

Use of DDT Decreasing in the U.S.

American farmers and gardeners are using less DDT than at any time in the last two decades. Inquiries among heavy users of DDT disclosed that, for the most part, cutbacks in the use have been voluntary. They have stemmed from insect resistance to the pesticide in most cases, from concern about pollution in others, and from state restrictions in a few.

1963 was the peak year for production of DDT in the U.S. Since then domestic use has decreased to one third. Exports, mainly used for control of malaria-carrying mosquitoes, have declined slightly.

U.S. Production of DDT in Millions of Pounds

	Produced	U.S. Use	Export
1963	178	60	118
1969	120	20	100

In most of the U.S. cotton-growing regions, however, where about two thirds of the domestically used DDT is applied, its use has continued unchecked. A comment by a Georgia cotton farmer was typical: "I'll use it for as long as I can get it," he said. And from the looks of governmental deliberations on the matter, DDT will be available to cotton farmers for some years to come.

Controversy on the National Level

Last November [1969], the Secretary of Agriculture issued a cancellation order, which would have prohibited use of DDT on shade trees and tobacco, around the house and in marshes; but this order was appealed by several manufacturers. The appeals set in motion a complex process of review, deliberation and adjudication that could last for several years, with these uses of DDT continuing legally. At the time

of this cancellation order it was announced that, after a departmental review, all but "essential uses" of DDT would be canceled. (If the Agriculture Department decides that DDT for controlling the cotton bollworm is an essential use, then much of its present volume would continue to be used.)

The Agriculture Department is also being challenged at the same time from the opposite direction. Several conservation organizations recently joined forces and brought a suit against the Secretary of Agriculture that resulted in a court order requiring him to explain why he had not banned DDT outright. Dr. Charles Wurster, a biologist with the Environmental Defense Fund, says that the conservationists' goal is to bring an immediate end to the use of DDT, which he calls "the world's No. 1 pollutant," and to the use of several other persistent pesticides. Dr. Ned Bayley, Director of Science and Education in the Agriculture Department and author of the Secretary's reply to the court order, maintains it is unwise to ban DDT completely before the department can determine whether some of its uses are essential, that is, that no acceptable substitutes are available.

State Laws

Some states, notably Arizona and Michigan, have banned virtually all uses of DDT with laws that have strong enforcement provisions. But state laws can sometimes contain enough loopholes to render them almost meaningless. Last year in Florida, for example, the Legislature passed a bill restricting the use of DDT and other persistent pesticides, with the following exceptions: Indoors, underneath buildings, or within a foot of buildings to control house pests; in health emergencies certified by state health officials; to control forest or farm pests where no safe and effective alternative is available; for research purposes; and for direct application on cabbage, corn, cotton, peanuts, soybeans and sweet potatoes.

Phasing-Out

The farmers and gardeners of America are engaging in their own, little publicized "phasing-out" program. In Mississippi, the use of DDT has been declining in recent years. The main reason has been diminishing effectiveness of the chemical as agricultural pests have become resistant to it. Truck farmers in the New Orleans area began eliminating DDT about 14 years ago because the cabbage looper developed resistance to it. And the Louisiana sugar industry ceased using DDT because the sugar cane borer became resistant.

The Fruit Growers League in Oregon gave up DDT nine years ago out of concern for the state's environment. Ohio farmers have been weaned away from DDT largely because traces began appearing in milk, and DDT residues in milk are prohibited. Florida farmers,

according to the Dade County extension agent, drastically reduced their use of DDT over the last decade because of the environment.

Depending on their needs, farmers have substituted a variety of pesticides for DDT. Most of them are far more toxic but far less persistent than DDT. So they are trickier to handle but do not leave the environmental legacy that represents the conservationists' main objection to DDT.

Gardeners throughout the country have also been shying away from DDT and other persistent pesticides. According to the Mecklenburg County extension agent in North Carolina, "People are scared of it. Mention DDT to the average housewife and you'd think she had hold of a rattlesnake." In Oregon, several suppliers reported that most gardeners and other non-commercial pesticide users have generally turned to relatively non-toxic and non-persistent pesticides.

According to the World Health Organization, there is no adequate substitute for DDT in controlling malaria in the developing countries. "The immediate discontinuation of the use of DDT would be a disaster to world health," the organization maintains. It has reportedly screened 1,300 possible substitutes for DDT in malaria control and found only two with promise--both of them costlier and less persistent than DDT and, therefore, less desirable in economic terms. But in the United States most areas stopped using DDT for mosquito control several years ago. Despite dire predictions to the contrary, the use of substitutes such as malathion and rotenone has not resulted in a dramatic increase in insect-borne diseases.

There is no doubt that the DDT picture is changing, however slowly. Only two companies are still manufacturing the chemical and even the major producer is not putting out DDT at full capacity. The intensified push of environmentalists will undoubtedly encourage increasing numbers of farmers and other growers to find alternatives to DDT. Nonetheless, even if all uses of DDT were to stop today, scientists estimate that it would be at least ten years before the environment could purge itself of half its current quantities of DDT.

[Excerpted from "Use of DDT at a 20-Year Low, Chiefly Due to Voluntary Action," The New York Times. New York: The New York Times Company, 20 July 1970, pp. 1 and 16.]

[EDITOR'S NOTE: See also Report of the President's Council on Environmental Quality, pp. 136-40.]

Insect Control: Alternatives to The Use of Conventional Pesticides

Robert W. Holcomb

[Methods of killing insect pests that could be used instead of the usual controversial chemicals are of several types and have varying degrees of proven effectiveness. Some have been used successfully on farms, others have had small-scale testing and still others are quite recently discovered but show promise. Much scientific work is needed before the full potential of most can be judged.]

Recent administrative actions by the United States Department of Agriculture (USDA) and several states have affected the licensing, sale, and use of DDT and a few other conventional pesticides. Although the actions will not drastically reduce the use of these chemicals in the near future, some observers believe they are the harbinger of the widespread curtailment of the use of chemical pesticides. Those who have pushed for this curtailment have argued that there are a number of pest control techniques that can be used in place of conventional chemical pesticides.

The alternative methods of pest control are in many stages of development, and several of them require more basic research before their potential can be evaluated; however, in most cases the greatest needs are for large programs to field test new techniques or for changes in existing relations among government, industry, and farmers that will make it possible to implement methods that have already been proved effective. One method with the potential of competing economically with conventional insecticides--the use of an insect hormone or a chemically related substance--is one of the most recent developments and is only now ready for field tests.

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Non-persistent Chemicals

The persistence of many conventional insecticides in soil or water and their tendency to become incorporated into biological systems were key factors in the recent insecticide actions. If these were the only disadvantages of pesticides, pest control problems could be solved with existing chemicals.

A number of new pesticides--principally a few dozen phosphates and a few carbamates--have been developed to minimize these characteristics. If the use of these and several of the more suitable chlorinated hydro-carbon insecticides is tailored to specific crops and crop situations, the problems of persistence and biological residues could be controlled. However, even the careful use of new chemicals would not solve other problems associated with pesticides. Insects would still be able to develop resistance to the chemicals, the new pesticides would continue to kill other animals and harmless or beneficial insects, and it would still be difficult to achieve a permanent solution of the insect problem.

Resistant Plants

Several USDA officials have referred to the use of crops that are resistant or partially resistant to insect attack as the most successful and least heralded of the natural methods of insect control. The control of the Hessian fly with resistant varieties of wheat is an outstanding example. The first variety of resistant wheat was introduced in 1942, and since that time the wheat in some regions has lost its effectiveness against the Hessian fly, but the problem does not seem to be as serious as the development of resistance to chemicals. When areas populated by resistant flies are discovered, another of the 22 varieties of resistant wheat is planted, and the change is generally effective for about ten years. In California the Hessian fly population has been reduced to such low levels by the use of resistant strains of wheat that they are no longer a problem.

Other resistant crops now being used or developed include alfalfa for the spotted alfalfa aphid, pea aphid, leafhopper, and alfalfa weevil; and barley for the greenbug. Corn inbreds have been released which are resistant to European corn borer, corn earworm, rice weevil, and corn rootworm. Several wheat strains are highly resistant to the cereal leaf beetle but have not yet been released for farmer's use. A number of trees and vegetables are also being screened for resistance to their insect pests.

While agricultural researchers are optimistic about the practicality of widespread use of additional resistant crops in the near future, they point out that it generally takes ten to fifteen years to develop even

partially resistant varieties of most crops. In some key areas--cotton, for example--progress has been slow.

Predators and Parasites

The introduction of natural enemies as the sole means of controlling pests of a seasonal field crop will seldom succeed because the natural lag between the time that the insect population reaches a maximum and the time that the enemy becomes numerous enough to reduce the insect population is such that crop damage occurs before control. This is generally the case with both insect predators and parasites and with pathogenic bacteria and viruses. In addition, the insect enemies generally do not eliminate the insect population but establish an equilibrium relation in which the insect population is often too high for the crop. Thus, these agents must be used with other control methods--such as resitant plants--or artificially applied at the appropriate time during each growing season. One of the major problems now and in the foreseeable future is getting natural enemies established. Of almost 700 insect enemies that have been introduced, less than one fourth have become established.

Natural enemies can be used to provide good control over tree and shrub insects when the loss of some foliage before the enemy becomes established is acceptable. But much work must be done on developing methods of dispersing insect enemies at acceptable cost and with equipment and personnel that can be made available.

The first successful control program using an artificially introduced insect involved the importation of the predator, Rodolia cardinalis, for control of the cottony-cushion scale of citrus plants. This and several other ladybugs could become increased in sufficient numbers to play an important role in insect control if the heavy use of broad spectrum pesticides is curtailed. In addition, several programs to artificially introduce predators in large numbers are in progress. One of the most promising is the mass rearing of the lacewing larvae for the control of the cotton bollworm.

Parasites, however, seem to have more potential for successful control programs; in fact, several parasites are now keeping the numbers of a few important insect pests reduced. Reece Sailer, Branch Chief of Insect Identification and Parasite Introduction of the U.S. Agricultural Research Service (ARS) believes that there will be no recurrence of the widespread destruction of elms that we have witnessed in the U.S. because a parasite of the vector of Dutch elm disease is becoming established. Agriculture entomologists often have cited the establishment of several parasites of the spotted alfalfa aphid as one of the most successful cases of natural insect control. The success of this program is due partially to the earlier develop-

ment of resistant species of alfalfa, and it now appears that the combination of the two pest control techniques may result in a permanent solution to the alfalfa aphid problem.

At one time an established parasite and resistant varieties of corn were controlling the European corn borer, but this pest has now reappeared without its parasite. The reason for this is unknown although Sailer thinks that the use of resistant corn may have reduced the borer population below that necessary to support the parasite. Whatever the reason, the failure illustrates the difficulties of parasite control and helps explain why many parasites that are available are not yet being used widely.

Bacteria and Viruses

There are a few pathogenic bacteria now in use, but for large-scale crop applications the use of bacterial toxins seems to be more promising. Bacillus thuringiensis was identified as an insect pathogen in 1927. In the early 1950s its toxin was isolated, and eleven serological types from all over the world have now been isolated. The toxins have complex chemical structures and it is not likely that they can be synthesized economically. But two companies have been producing a commercial toxin prepared from cultures, and there are reports that several other pharmaceutical companies are working on highly pathogenic strains of their own.

Bacillus thuringiensis toxins are not specific, although different insects show large variations in susceptibility, so in some cases they would be used like a broad spectrum insecticide. They have little effect on higher animals. Arthur Heimpel, Director of the Insect Pathology Pioneering Research Laboratory of the ARS, says that insects will probably not be able to develop resistance to the toxins as easily as they do to conventional insecticides. For specificity, insect viruses seem to be more promising than insect bacteria. Heimpel says that 254 viruses have been isolated that are pathogenic to insects and that about ten of these are "feasible" for near-term use.

Several hurdles must be cleared before viruses can be used widely. Methods must be developed to grow them economically on artificial media, and techniques for dispersing them under field conditions are needed. For example, many viruses are damaged by ultraviolet radiation, so methods must be developed to get them onto crops while protecting them from sunlight.

Other Chemicals

In addition to toxins that are obtained from insect pathogens, there are two other categories of chemicals that are potentially useful for

insect control. One group can be loosely gathered under the heading attractants; the other group consists of a number of chemicals that are associated with a set of insect development hormones.

Agricultural scientists generally refer to three types of attractants--food, sex, and ovipositional. Several of the latter are known, but they appear to have little potential for insect control. There are many uses for food attractants, and several are quite successful. For example, methylbutanol attracts and kills male oriental fruit flies and is widely used in control programs. The most active research area, however, is in the use of sex attractants.

The first sex attractant (these are also called pheromones) was isolated from the female gypsy moth in 1960, and since then some 200 have been discovered. According to Martin Jacobson of the ARS, about two dozen that may be useful for pest control have been identified. Attractants for the male pink bollworm, the cabbage looper, and the fall armyworm are commercially available. These were originally extracted from the female insects, but synthetic compounds are now available.

The use of pheromones for some control schemes seems likely. For example, field tests of a synthetic attractant for the female boll weevil have been encouraging. However, their use in inexpensive spray programs may be limited because their effect on insect behavior is both subtle and complex. Changes in the time of day when the pheromone is applied and small variations in the concentration can determine whether an insect is attracted or repelled and in a few cases may even determine which species is affected.

Development hormones or related compounds seem to show more promise for inexpensive, widespread use than do the pheromones. Many insect physiologists think that insect development is controlled by a brain hormone that regulates the juvenile hormone and ecdysone--the hormones responsible for larval and pupal development, respectively. Both substances are potentially useful for insect control because when present at certain stages of development they cause the formation of abnormal insects that cannot develop or reproduce.

Since 1964 several laboratories have been in on the search for plant extracts containing juvenile hormone, ecdysone, and related compounds. Ecdysone, although valuable for insect physiology studies, has a complex chemical structure that would be difficult to synthesize commercially. On the other hand, the juvenile hormone and hundreds of related compounds have been synthesized, many of them act on contact, and they appear to be harmless to higher animals. However, until recently scientists have been working with milligram quantities of the substances; so large-scale field tests and animal studies have not been conducted.

The use of hormone-like compounds for insect control now looks promising enough for several companies to have started programs of their own. Perhaps the largest effort in the United States is being conducted by Zoecon Corporation of Palo Alto, California. Vice President Daniel Lazare said that the company has several hundred compounds with varying degrees of development potential, and that several have been field tested. He also said the company was formed with the idea of producing a marketable product in about five years after spending close to $10 million--about the same amount of time and twice as much money as required to develop a conventional pesticide.

The Sterile Male Technique

For many years Edward Knipling, Director of Entomology Research of ARS, has advocated the programed release of sterile male insects as a means of eliminating pest populations. Although difficult to carry out in practice, the basic technique is simple. Male insects are sterilized in such a way that their normal mating habits are not altered. Female mates of the sterilized males lay infertile eggs so their offspring do not develop. When a high ratio of sterile to normal males is maintained the population will decrease.

The sterile male technique is used successfully along the border between California and Mexico to control the Mexican fruit fly, and last month the USDA in cooperation with California and Arizona officials began releasing sterile pink bollworms in an effort to eliminate this important cotton pest from the San Joaquin and Coachella valleys.

Sterilization is now being considered as one part of an integrated control scheme that might someday eliminate the boll weevil. Knipling said that some control programs might have succeeded by now if they had been started ten years ago. Recent advances should make the chances for success even better now. These include improvements in mass rearing techniques, the development of chemical and hormonal sterilization methods, and a few successful field tests where sterility or some other "favorable" trait was passed on genetically.

How do You get There from Here?

Some basic research remains to be done, many field tests must be conducted, and tactics for using different pest control methods must be developed. But even when this is done, the problem of administering the programs remains. The economic returns of pest control are quite high, especially if an insect population is permanently reduced or eliminated. For example, the annual cost of the screwworm program is one fifteenth of the estimated annual losses due to control costs and livestock damage before the insect was eliminated. The

problem is not one of overall economics but one of rechanneling money. We have knowledge of pest control methods that will solve many of the problems associated with the use of conventional pesticides and that could pay for themselves in the long run. But the relations that have evolved among the government, industry, and farmers to implement the use of conventional pesticides appear to be unsuitable for the initiation of new control measures.

[Excerpted from Science magazine. Washington (D. C.): the American Association for the Advancement of Science, Vol. 168, No. 3930, 24 April 1970, pp. 456-458.

MARKETING AND THE FARMER

MARKET IN TAIWAN
(PHOTO: U.S. AGENCY FOR
INTERNATIONAL DEVELOPMENT)

Integrating the Rural Market Into the National Economy of Mexico

Delbert T. Myren

[Imaginative and active policies on the part of private distributors and government are needed to bring the inputs of modern agriculture to the small farmer in Mexico. Only then will 80 percent of the farm families be able to break out of near-subsistence farming, and realize enough extra income to buy manufactured consumer goods.]

Until recently, the rural sector was considered important in many countries primarily as a source of foreign exchange through production of export crops. Today it is important for three other reasons: first, it is responsible for producing food to provide an adequate level of nutrition for the nation, and--in many countries--for avoiding or reducing the importation of food and its effect on the balance of payments. Secondly, in most developing countries, most of the citizens live in the rural areas; what they can contribute to the political and social life of their nation is very much keyed to how fully they share in its economic advancement. Thirdly, the rural sector is the largest area for prospective expansion of the national market. Nearly all of the products produced by industry have substantial economies of scale both in manufacturing and in distribution, and it therefore becomes of great importance to have as large a market as possible for manufactured products.

The Mexican government has made well-placed investments in the development of new technology for modernizing agriculture as well as large investments in the fertilizer industry. Government price-support programs combined with crop insurance have helped to

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assure farmers a return on their investment. Large investments in highways and feeder roads have helped to connect isolated farming areas to urban markets. Agricultural extension and credit programs have accelerated agricultural development. The result of these programs has been an agricultural growth rate of about 6 percent annaully--one of the highest in the world. It would be no small accomplishment for a country to increase food production as rapidly as its population was increasing; Mexico went from importing 50 percent of its wheat to exporting some wheat while the consuming population nearly doubled. Mexico has also satisfied her corn needs and become an exporter even at a time when modern poultry and hog enterprises have been consuming rapidly increasing amounts of corn and sorghum. This greater agricultural production continues to be a crucial factor in the industrial development of the country. But it is still not enough, because the larger part of the increase in production has been achieved by only a small fraction of the farm families; the vast majority of farmers have not participated fully in this growth and consequently do not yet constitute a market for most consumer goods.

The Three Sectors of Mexican Agriculture

The rural market is made up of a relatively small modern sector, a large traditional sector, and a growing transitional sector. The modern sector, which has contributed most to the agricultural growth, is located principally in the irrigated areas. In it, the farmers use fertilizers, improved seeds, insecticides, etc. They base their production of crops and livestock on market demand, and purchase much of the food consumed by the family. They use bank credit and crop insurance. Many of them live in nearby cities rather than on the farms or in villages, and they commute to their farm land by car or truck. Their children attend primary, secondary, and often preparatory schools, and sometimes go on to college. They live in modern houses equipped with radios, television, and indoor plumbing and their homes are located on paved streets. In Mexico today this commercial-farming sector takes in approximately 20 percent of the farm families; some would say that the group is much smaller, but I am including all farmers who sell 75 percent or more of what they produce. This 20 percent includes most of the farmers who use the inputs of modern agriculture, but only a part of the farms are mechanized (the 1960 census indicated that less than 2 percent of Mexico's farmers had tractors at that time, though many more hire tractor services from their neighbors).

In the traditional or subsistence sector, at the other extreme, the farmer usually lives on his own parcel or in a small village nearby. He cultivates his land in much the same way that his father and grandfathers did, with rudimentary implements that have been used for centuries. He produces mainly crops that are consumed at home and farms chiefly to subsist. When the harvest is exceptionally good, he

may sell a surplus and with this income occasionally enter the market for consumer goods. For present purposes, we may define the subsistence farmer as one who with his family consumes more than 75 percent of what he produces. If he is fortunate, there is a primary school near enough so that his children may attend it while living at home. His own level of education is low: in many cases he is unable to read and write. This group accounts for perhaps 35 percent of Mexico's farm families.

To the growing transitional sector belong the farmers who are moving from traditional ways to a modern agriculture. We may define the transitional farmer as one who with his family consumes from 25 to 75 percent of what he produces. This sector accounts for roughtly 45 percent of Mexican farm families. We cannot demonstrate that all of these farmers are necessarily selling a progressively higher proportion of their harvest each year, but only that they are all located somewhere between subsistence and a truly modern commercial agriculture.

The modern sector has already been incorporated into the national economy and is providing a growing market for consumer goods. The development of a broader rural market can only come about through transformation of the large traditional and transitional sectors. A mass market for consumer goods among 80 percent of the rural population will not come until their purchasing power sharply increases, and then only with efforts to raise the efficiency of agricultural production.

Increasing Rural Purchasing Power

Making consumer goods available and creating a desire for them may result in increased agricultural production by those wanting to buy the goods, especially where there is an existing surplus of labor and an obvious way to use it in agricultural production. But most increases in production and consequently in purchasing power must come through a frontal attack on gaining the adoption of improved farming practices. There is unfortunately a great deal of fatalism among both governmental planners and private entrepreneurs in regard to the traditional and transitional sectors. Private firms consider that the level of purchasing power in these sectors is so low that they cannot afford to touch them. Officials of governmental programs point out that their resources and personnel are inadequate to achieve what is expected from the programs and that consequently they must use their credit, crop insurance, and technical assistance where their limited staffs can work with farmers who control a sizable acreage. The risks, they say, are greater with small farmers, and the overhead is nearly 20 times higher when lending money to 20 farmers each having two hectares of corn than to one farmer with 40 hectares of corn.

The banks give preference to the larger operators and to the irrigated areas where there is less risk of crop failure. The crop in-

surance agency cooperates by insuring these loans, and the price-support agency purchases the harvest. Those who do not get credit from the agricultural banks generally do not participate in the other two programs. The result is a type of circular causation that further benefits the present modern sector but is of limited use to the sectors which we want to bring into the market economy. The structure of opportunities for the traditional and transitional sectors is therefore most inadequate compared to that for the modern sector.

The Promise of Modern Agriculture

The opportunity to break out of this traditional poverty is presented by the nature of modern agriculture today. Although the big tractor is widely accepted as the symbol of modern agriculture, the true essence of "modern" is in reality more chemical and biological than mechanical. The new technology is chemical fertilizers, insecticides, fungicides, and herbicides; it is new disease-resistant and higher-yielding varieties; it is antibiotics to control diseases and help animals produce more efficiently; it is the products of this new technology with which it is possible to double, triple, even quadruple production with the same amount of land and the same amount of labor.

It is true that a small number of the larger private farmers have been the first ones to recognize the potential of this modern agriculture. But my point is that there is nothing intrinsic in the use of these new inputs that must keep the small farmer, currently in the traditional sector, from adopting them. There are no significant economies of scale in either their purchase or utilization. Most can be purchased in small units and can be applied as well by hand or with hand-powered equipment as by machine. There are, to be sure, pockets of rural poverty which, because of topography and inadequate rainfall, cannot easily benefit from these modern inputs; but this is not the situation of the majority.

One of the truly dramatic changes in Mexican agriculture has been the use of chemical fertilizer, especially nitrogen. Twenty years ago the use of chemical fertilizer was virtually unknown. In 1964 the total use was 268,058 metric tons of elemental nitrogen, of which 146,365 tons was produced in Mexico and 121,693 tons imported. By 1970, it is estimated, agriculture will be using between 419,000 and 630,000 tons of elemental nitrogen a year, all of it produced in Mexico and valued at 2,000 million pesos MN [12.5 pesos = $1]. The area making use of fertilizer is expected to increase from 1.8 million hectares in 1960 to 5 million hectares or about one third of the harvested acreage in 1970.

Let us play with figures for a moment and see what this fact alone may mean in available income in the rural sector. Laird and Rodriguez have calculated the total cost of using nitrogen at 5.16 pesos per kilo-

gram. Under relatively unfavorable conditions they have obtained nearly four pesos return in corn production for every peso invested in nitrogen. If on the average a similar response were obtained for the additional 300,000 tons of elemental nitrogen that it is predicted will be consumed, the total cost of the additional nitrogen would be about 1,500 million pesos and the additional income in the rural sector would approximate 6,000 million pesos. If only two pesos were obtained for each additional peso invested in fertilizer, the additional income would approximate 3,000 million pesos. These figures are only for the use of nitrogen fertilizer. In many areas of the country phosphate fertilizers also give substantial increases, and other increases are being obtained through the use of herbicides, insecticides, fungicides, and improved seeds.

For the individual smallholder the projections are modest but equally striking. If the farmer with five hectares of corn applies 120 kilograms of nitrogen per hectare, he will apply a total of 600 kilograms. If the use of nitrogen costs him 5.41 pesos per kilogram (4.58 for the fertilizer, 0.10 for transporting it to the field, 0.25 for applying it, and 0.48 for harvesting, shelling, and transporting the increased yield to market), the total cost of applying this fertilizer will be 3,246 pesos. If from this application he receives an increase in yield of 2.64 ton/ha., as Laird and Rodriguez did on the average, he will have an additional 13.2 tons of corn at harvest with a total value, at 800 pesos per ton, of 10,560 pesos. Deducting the cost of using the nitrogen, this leaves 7,314 pesos of additional income, or additional purchasing power for this farm family. When this happens, the farmer will have sufficient income to decide whether to spend it on a radio, sewing machine, shoes, toys, toothpaste, or shaving cream, and whether to buy this brand or its competitor.

Breakthroughs Needed

It is going to require some major breakthroughs to integrate the rural market into the national economy, and these will only come if someone believes they are possible and invests money and highly skilled personnel in the job. We especially need a breakthrough in ways of efficiently channeling knowledge, credit, and modern production inputs to a vast number of small farmers. Ths cost of paperwork for extending credit is much too high. The communication of knowledge through our technical assistance programs is much too costly. There must also be a way to include more small producers and especially more of those on unirrigated land, in the crop insurance programs; they are the ones who need security the most because they are exposed to the greatest amount of risk and uncertainty when they try anything new. How can a low-cost distribution system be worked out that will make the inputs of modern agriculture available throughout the Republic?

At present, the availability of many of the inputs of modern agriculture is a very relative affair. Fertilizer is available in the Yaqui Valley, where eight or ten companies compete to see which can give the best credit terms and apply the fertilizer directly on the farmer's land. However, in much of the country the small farmer lives isolated from the salesmen of modern production inputs. If he finds out about fertilizer through the experience of a neighbor, he may take the bus to the nearest city where fertilizer is sold. But there he usually finds that he cannot get credit because the store owner does not know him. After trying the banks, he goes home. Or if he is not yet ready to give up, he goes to a local moneylender whose rate usually runs to 5 percent a month. Is fertilizer available? Yes, but not easily available. Private initiative must therefore begin to believe that a new potential market actually exists and that it will still be here five or ten years from now, and must start to make more long-term plans and investments.

In regard to the distribution of knowledge, the prospects for a breakthrough are better than ever before. A multimillion-peso road-building program is rapidly linking the entire country. Agricultural scientists and extension agents can rapidly enter regions that were effectively isolated a few years ago. These same roads are making it possible for the farmers themselves to travel to other areas and observe new methods of farming. On the mass communication side, a breakthrough in the design and manufacturing of the transistor radio has opened a vast new field of communication. Nine years ago, when we were discussing a pilot project to determine the potential of radio for communicating information to farmers, we had to be concerned not only with transmission and content but also with how to obtain the necessary receivers. The project was never started, but in the short time since then the receiver problem has been taken care of. In many rural villages today nearly half the farmers have radios.

Fortunately, modernization does not have to wait upon mechanization. Whole new vistas open up if we recognize that where agricultural land is relatively scarce and rural labor abundant we can begin to modernize through a wholly different group of inputs: improved seeds, fertilizers, pesticides, and other cultural practices. If imaginative, active private suppliers find the ways to make these inputs readily available to small farmers, and if government provides credit, technical assistance, and insurance against undue risk, this will effectively offset the advantages that larger farm units now enjoy in applying new technology.

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Market Processes and Economic Development: A Colombian Case

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[Recommended changes in the present food assembly and distribution system in the city of Cali will result in reduced prices of food at retail stores, greater accessibility to urban consumers, and increased production incentives to farmers. These recommendations are among those resulting from a study of agricultural and market processes in the Cauca Valley region.]

Role of Market Processes

The food system of a city and its agricultural supply area is treated in this study as a set of interrelated stages of activity which include: the manufacture and distribution of agricultural inputs such as seed, fertilizer, machinery and pesticides; the farm production activities; and the assembly, storage, processing and distribution of food products to consumers. Coordination of these activities is achieved largely through market processes. Market processes are also seen as part of the social system: the behavior of market participants is conditioned by social customs and traditions which affect exchange relationships, attitudes toward institutional change and willingness to adopt new procedures.

Market processes increase in relative importance as a community develops, and as more of the population move to urban areas. As modern technology is introduced into agriculture, farmers purchase industrially-produced inputs such as fertilizer, pesticides, and machinery. At the same time, the consumer's food costs include a growing percentage spent on post-production market services. As a result of these changes, marketing activities become a larger proportion of total economic activity while the percentage of

farm production declines. Because food production and distribution make up a large proportion of economic activity in less developed countries, increased productivity and reduced real costs of food can have a significant impact on living standards and the economic growth rate. It should be stressed that productivity increases in the processing and distribution stages can be just as important for total food costs as productivity increases in farm production.

In most developing countries there is a lack of information about existing production and distribution systems and consumption of agricultural and industrial products. Hence, a useful first step toward problem identification is to carry out a descriptive, diagnostic study. In our study of the Cauca Valley we used the following framework: market structure variables are the number, the relative and absolute size of participants, and the conditions of entry and exit. Conduct variables are the behavior patterns of market participants as they arrange transactions and work out procedures for interfirm coordination. Public participation and regulations are also considered under conduct. Performance variables are selected results relevant to the attainment of broad social and economic goals. Three performance criteria are of central importance:

1. Resource use efficiency--to what extent is the system achieving the lowest possible costs? Are there obstacles to efficient resource use patterns? To what extent are consumer demands being accurately transmitted to farmers, processors, and distributors? Cost comparisons for alternative ways of organizing subsectors of the production-distribution system are used to judge relative economic efficiency.

2. Progressiveness--to what extent is the system generating and rapidly adopting new technology that reduces production and distribution costs for presently consumed goods and services? To what extent is the system developing new products or improving the quality of existing products to satisfy changing consumer demands?

3. Equity--are there institutional barriers which cause a socially and politically unacceptable distribution of income from the system? Are there groups of participants who seem to be seriously disadvantaged? What is the effect of inequities in income distribution on the dynamic growth process?

The Cauca Valley Region

Our study was focused on the city of Cali and the area which supplies most of the major food products for the city. Cali is the capital of the state of Valle and is the dominant commercial center in the southwestern area of Colombia. The configuration of the supply area varies by commodity and was identified on the basis of a checkpoint

study of trucks entering Cali, supplemented with source-of-purchase information obtained from product wholesalers. The flat part of the Cauca Valley has an area of approximately 430,000 hectares extending 200 kilometers from north to south. Sugar cane, corn, soybeans, cotton, and beans are the principal cultivated crops. The soils are exceptionally fertile and adaptable to mechanization; most of the land is held in large units. In the mountain highlands surrounding the Valley, however, there are many small farmers. Coffee is their principal cash crop, although fruits, vegetables, corn and beans are also produced in small quantities.

The food system is the major economic activity linking the rural area and urban centers. In 1969, more than 40 percent of total consumer expenditures in Cali were spent for food. It was also estimated that at least 40 percent of the labor force in Valle was employed in food production, distribution and closely related service industries. We estimated that if food prices in Cali could be lowered by 10 percent through improved coordination within the food production-distribution system, the demand for non-food consumer goods would increase by about 5 percent, while the quantity of food purchased would increase by 2 percent (see Table 1).

Table 1: Estimated Effect of a 10% Reduction in Food Prices on the Demand for Additional Food and Non-food Products in Cali

Level of Family Income per Capita, Pesos per Month	Peso Expenditures per Capita per Month			
	Present (1969)		After 10% Reduction in Food Prices	
	Food	Non-food	Food	Non-food
Under 125	75.19	15.43	70.44	20.18
126-240	112.27	64.65	105.09	71.83
241-500	161.08	178.86	149.32	190.62
Over 500	294.02	769.59	267.85	795.76
Citywide Average	152.30	227.12	140.68	238.74

At the time of the study 16.90 Colombian pesos equaled $1.00 U.S.

The increase in demand for food, along with a greater stability of commodity markets that can be achieved through institutional reforms, could serve as a stimulus to farmers to expand output and to adopt more modern production practices. This in turn would increase the demand for purchased inputs such as fertilizers, pesticides and machinery which are manufactured in urban centers. In addition, the increase in demand for non-food consumer goods by both urban and rural residents should also stimulate the demand for industrial products. This stimulus could be reinforced by efforts to create a market-

oriented production-distribution system for manufactured consumer goods. Improvements in the consumer goods distribution system could also reduce retail prices and broaden the market for these goods. Thus, the aggregate effects of these moves to improve market coordination, as described, would do much to stimulate economic growth and increase productivity and incomes.

The above conceptualization of the effects of improved market coordination on regional economic growth emphasizes resource use efficiency as a major goal. But a comprehensive regional program to improve the food system requires a balance between efforts to reduce food prices on the one hand, and activities to improve food quality and increase consumer services on the other. As new technologies are introduced into the food system, the cost of existing products and services should decline. But as incomes increase, consumers will demand cleaner, higher quality and more easily prepared foods; market improvements to satisfy these demands tend to increase food costs. We have chiefly emphasized the short-run need to reduce food marketing costs, while maintaining a longer run perspective on the need to promote a progressive food system to meet changing patterns of demand.

A Summary Diagnosis of the Cali Food System

The food distribution system serving Cali is becoming increasingly unsatisfactory for a population center of nearly one million people. Most of the food arriving in Cali passes through the Galeria Central area located in the center of the city. Each morning several thousand small retailers converge on this market to buy supplies and haul them back to their neighborhood stores or to market stalls in the six public markets. The physical congestion of vehicles and people coupled with logistical problems of using old residences as warehouses adds unnecessary costs to the system. The condition worsens as the city grows. Handling practices for fruits and vegetables result in unnecessary product loss and deterioration, while unsanitary conditions in meat handling expose consumers to health risks and reduce product palatability.

Nevertheless, the combined wholesaling and retailing margins for basic foodstuffs appear to be relatively low as compared to more developed countries. But margins are low largely because of the low returns to labor and the small amount of marketing services provided. Consumers frequently travel long distances to buy food, especially meat, fruits and vegetables. Low income families in the newer areas of the city have the least access to the public markets and larger retail outlets. Their alternative is to buy from small neighborhood stores (tiendas) where product variety is limited and prices are significantly higher than in the more distant public markets or large food stores. Entry into food retailing is relatively easy, the operations

are typically very small, and business failure rates are high. There is little evidence of high returns to capital or labor with the possible exception of beef wholesaling and retailing.

Although the system is very slowly evolving toward more modern food distribution practices, there are substantial barriers to this process of change. The existing wholesale system makes it difficult and time consuming to acquire a broad line of merchandise and to arrange transportation. Individual retailers find it difficult to enlarge their businesses, broaden product lines and reduce costs. They have limited knowledge and skills in managing food operations, and credit is usually not available from commercial lending agencies. Public intervention frequently discourages private intermediaries through subsidized competition and arbitrary application of regulations. Most of these constraints on innovation are beyond the control of individual food distribution firms. Hence, public or group action is needed to break this low-level equilibrium and create an environment that will encourage desirable patterns of change.

Our studies indicate the feasibility of a market improvement program in Cali that could reduce urban food distribution costs by 20 to 25 percent while at the same time substantially improving services to consumers, especially those in the lower income areas. In the proposed system larger neighborhood stores would be established so that consumers can buy nearly all their food needs within walking distance of their homes. These larger stores would be linked with a wholesaler handling a broad line of products who would provide management assistance and credit. These wholesale-retail units can achieve lower costs through increased scale of operations, and improved coordination of the wholesaling-retailing operation that will reduce transportation and transactions costs. The investment costs of extending this retail system into new barrios would actually be less than the cost of extending the present system of tiendas and public markets. The proposed urban food distribution program also includes measures to improve meat handling through larger wholesaling and retailing units, better merchandising practices, and by remodeling the existing slaughterhouse.

A new food wholesaling facility is needed to reduce costs and to eliminate the undesirable social and aesthetic conditions now existing in the center of the city. The detailed planning of this center is already underway. The new wholesale center will be located on the periphery of the city near the junction of major incoming highways and principal belt-line avenues connecting all the major sections of the city. If the center is properly constructed and operated, the costs of food handling should be significantly less than if the present system continues to expand.

The major products flowing through the present wholesale center are grains, meat, fruits and vegetables. Milk, poultry and eggs move largely through specialized wholesale channels. The existing grain assembly system which links into the urban food system is performing relatively well. Large assemblers are competing with each other and with large processors for grains produced on large commercial farms. Assembler's margins are relatively low for services rendered. However, the coordination of the assembly system with urban centers could be further improved by a more accurate and timely price information system and a reliable system of estimating crop size. There is an apparent need for additional grain storage capacity in Northern Valle. A shift from bag toward bulk handling can reduce costs of moving grain that is transported directly from large farms to grain processors' bulk storage facilities.

In the fruit and vegetable sub-system, many conditions contribute to relatively high marketing costs, poor product quality, and unstable prices and supplies. Production tends to be widely scattered geographically, and nearly all phases of production and distribution are carried on by small firms operating with relatively low levels of technology. Modern technology can reduce short-term seasonal supply fluctuations; there have been recent efforts to introduce more modern systems of production and distribution for pineapples and oranges, and tomatoes for processing are produced under contracts closely supervised by the processors. Further efforts are needed to encourage geographic concentration of fruit and vegetable production and the adoption of improved production and handling practices. Credit policies can be used as a tool to achieve these changes. Coordination between urban wholesalers and rural assemblers can be facilitated by improved market information based upon a simple system of product classification. The organization of local producer associations and concentration centers are also means of improving the assembly market and stimulating efficient production methods.

Fruit and vegetable processors confront problems in the procurement of raw materials. The proposed program to foster greater geographic concentration of fruit and vegetable production, and the development of producers' cooperatives, should ease processors' procurement problems. Several of the packaging firms appear to be progressive and have the technical capacity to provide specially-designed containers; our studies indicate there is an opportunity to improve product quality and reduce labor costs in handling by using improved packaging for fresh fruits and vegetables. At present, however, the domestic market for canned or preserved fruits and vegetables is very limited. A favorable climate makes it possible to have a year-round supply of a great variety of fresh foods. Domestic help is plentiful and inexpensive. And the cost of the glass or metal containers for preserved foods is relatively high; for many fruits and vegetables, the container is more expensive than the food it holds.

Agricultural Inputs

We found that for some of the major technical inputs--improved seeds, fertilizers, pesticides, farm machinery and feed concentrates--there are fairly well-developed distribution channels and reasonable margins. For some domestically produced inputs, e.g., fertilizer, there appears to be more plant capacity than will be needed to meet short-run increases in demand. Furthermore, most farmers, except for some fruit and vegetable producers, are making extensive use of these technical inputs. Nevertheless, actual grain yields and feed conversion rates in poultry and egg operations fall considerably short of achievable productivity levels. The major problem seems to be a lack of practical information about the most economical input combinations under existing prices and physical conditions. A second general problem is that many distributors are unalbe to control inventories and predict demands for the technical inputs, resulting in both excessive inventory maintenance costs and frequent out-of-stock conditions for individual products. Credit availability did not appear to be a significant deterrent to the use of technical inputs among the larger commercial farmers (especially grain, poultry and egg producers), but is more of a limiting factor for small producers, many of whom are located in the mountainous areas of the region.

In order to improve the results from the use of technical farm inputs, we recommended that the Instituto Colombiano Agropecuario expand its program of applied research on optimum combinations of inputs and disseminate this information as rapidly as possible. A training program for farm input manufacturers and distributors was recommended as a means of improving inventory control and physical distribution.

Some Barriers to Change

These include: 1) some government policies and underlying attitudes toward intermediaries and their contribution to total economic output; 2) some existing laws and regulations which adversely affect efficient resource use; 3) the limited ability and willingness of existing firms to innovate.

A pervading attitude of distrust and antagonism toward private intermediaries prevails and is reflected in policies establishing direct government intervention in distribution activities, rules against speculation, and various forms of price control. The tendency is to maintain farmers' prices and reduce consumer prices, with little concern for the middleman. There has been a notable lack of technical assistance and special credit programs to improve productivity and incomes among food system intermediaries. This seems to imply a belief that "production" is largely the physical creation of products on farms or in factories, and that marketing services add little to the final product value.

Our recommendations emphasize the role of government in stimulating economic development through regulation, research and educational efforts, and through direct intervention when critical services are not being provided by the private sector. Nevertheless there is much evidence that individual initiative is important to development, and that a competitive market contributes to high-level performance. The role of government as a catalyst and facilitator of private efforts in food distribution warrants some careful reconsideration within the Colombian political system. Several laws and regulations appear to have some very undesirable effects on the efficiency of resource use: for example, the Colombian labor code requiring substantial wage rate permiums for work at night and on weekends or holidays discourages firms from making fuller use of manufacturing plants and other expensive capital equipment. There are other regulatory codes that tend to be both idealistic and overspecified; they become barriers to the adoption of new techniques, and encourage unproductive behavior in avoiding the legal requirements.

There are also some structural, attitudinal and knowledge barriers to progressive behavior among participants in the food system serving Cali. The predominantly small retailers and small wholesalers are limited in their ability to make major changes in their operations. Many live close to the level of subsistence; they cannot command significant amounts of credit, nor can they afford to risk large losses. Most have relatively little formal education or knowledge about modern food distribution and management practices. A major change in this system will either require new operators willing and capable of managing larger, more complex firms, or significant training and technical assistance for existing operators. There are some large-scale units engaged in farming, product assembly, food processing and consumer goods manufacturing; some of these firms are relatively progressive, and most have the financial capability to make significant changes in their operations. However, they are slow to adopt new methods of operation. We found very few industrial entrepreneurs or managers who were market oriented--that is they did not see attractive profit opportunities in looking for unexploited markets and then providing new products and services. Most firms are "one man shows," which is probably a reflection of lack of confidence in their employees. Few decisions can be made when the top man is absent, and business slows down. In large-scale farming there appears to be a reluctance and inability to fully exploit available technologies; this may be due to lack of knowledge, to a lack of motivation to seek additional income through intensification of farm operations, or to inability to rely on hired supervisors and farm laborers to carry out the more complicated tasks.

In addition to these barriers, it would be reasonable to expect that political leaders will be reluctant to support changes that will displace or adversely affect any large or politically powerful group of market

participants. Consumer resistance, however, is not expected to be a serious barrier to the changes we recommended. Consumers desire more convenient food outlets, especially if the new stores can provide low prices and higher quality food. In some instances information programs may be needed to encourage changes in consumer food buying practices, e.g., to stimulate demand for pasteurized milk.

To summarize: On the basis of our recommendations, it seems possible to reduce real costs of food to urban consumers in Cali by at least 10 percent over the next decade, and at the same time achieve significant improvements in marketing services. Approximately half of these savings could result from changes in urban food distribution and the other half from increased productivity in farm production and assembly market operations.

Given the rapid population growth in Cali of approximately 6 to 7 percent annually, and a corresponding or greater increase in the demand for food, it would be possible over a period of five years to increase labor productivity in the food system by at least 30 percent without a net reduction in the total number of people employed in food distribution. An increase of 10 to 20 percent in labor productivity would permit continued growth in the food distribution labor force. Therefore, it seems unlikely that the anticipated changes would cause a critical net reduction in jobs in urban food marketing, although there might be considerable change in the composition of the labor force engaged in food distribution, with store employees replacing some of the low-income street peddlers and unpaid family labor in small tiendas.

[Excerpted from Market Coordination in the Development of the Cauca Valley Region--Colombia. East Lansing (Mich.): Latin American Studies Center, Michigan State University, Research Report No. 5, 1970, pp. 4-9 and 350-362.]

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Attitudes Toward Agricultural Marketing in Asia

G. R. Spinks

[Outdated and often erroneous notions about marketing held by officials and policymakers--both national and international--continue to get in the way of treating agricultural marketing objectively and positively. In-depth empirical studies, wider circulation of marketing literature, special courses and in-service training are some possible remedies.]

Although considerable progress has been made, particularly over the last decade, agricultural growth in the developing countries has not attained the levels anticipated by governments and various foreign aid programs. A major reason for this is that not enough attention has been devoted to facilities and services which must be available to farmers if agriculture is to develop. Agricultural marketing in particular has not yet been fully accepted as an essential element in agricultural development in the countries of the region.

The reasons for this lie mainly with the governments of the countries concerned, but also with multi- and bilateral aid agencies. The principal cause is the lack of understanding on the part of government officials of what constitutes agricultural marketing, particularly on the part of officials at the policymaking level. Linked to this are the problems of uncritical acceptance of opinions and impressions as fact; unwillingness to appreciate facts which are contrary to the opinions held by high-level officials and/or contrary to government policy; inability or unwillingness to acknowledge that facts become outdated because of structural changes in the agricultural sector; and general bureaucratic procedures.

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Government Attitudes Toward Agricultural Marketing

In official thinking the concept of marketing tends to be restricted to the assembly of produce at the first market, or to the sale of produce on export markets. Such an approach can be observed at international meetings on agricultural development, where one of the main problems often voiced is the "marketing of our products." The relationship between marketing and production is overlooked and the possibility that marketing must play an important role in agricultural development is seldom considered. A similar situation exists in respect of increased efficiency in the marketing of agricultural products and its importance in economic development.

An examination of any Asian country will indicate areas where determined and appropriate government action could improve efficiency. Unfortunately, most government participation has been based upon inadequate and faulty advice, with the belief that ills can be cured by governmental decree alone. The common practice of issuing marketing legislation without any attempt to implement it is an example of this attitude. In short, a more objective approach needs to be adopted by governments and, in many instances, by their advisers, both national and international.

Bureaucratic Factors Influencing this Attitude

A new field. In most of the countries of the region, any department, division or section of the government service responsible for agricultural marketing has a relatively short history. In several countries, there is no individual group entrusted with agricultural marketing matters. Few agricultural marketing sections have as yet established themselves as an integral part of the bureaucracies within the region. In some countries which have experienced acute food problems, there has been a proliferation of government departments engaged in various aspects of marketing. Responsibilities are often divided, and cooperation between the ministries involved or even between sections of the same ministry is seldom achieved or even attempted. Duplication and ministerial rivalries are fairly common.

The confusion of the situation is intensified by the special position afforded cooperatives in government services. They tend to be considered separate and distinct institutions; only limited reference is made to the fact that a cooperative engaged in marketing is a form of marketing enterprise. In some countries, the alleged social benefits accruing from the cooperative movement are given greater emphasis than the commercial activities, and workers in the field of cooperatives tend to see this form of marketing organization as sacrosanct. One would like to see all types of marketing agencies competing with each other to provide the most efficient services to producers and consumers, but without subsidies or monopolistic privileges.

Low status. Overall experience indicates that the sections associated with agricultural marketing have a lower status rating within the government service than others of equal size (size being determined by the number of staff). Where the marketing section has been granted status within the government service, it sometimes reflects an association with another "recognized" field of study, or the personal interest of a senior government official. The quality of the staff is often below that of the older and more accpeted sections of ministries. Leadership and coordinated planning are seldom to be found, and few of the elite among university graduates are assigned to marketing; the more qualified and better trained personnel, particularly the younger groups, are anxious to move into the more privileged sections of government with better prospects of promotion. As a result, agricultural marketing is sometimes deprived of the best elements among its staff; even those who have studied abroad and/or have had specialized training are very often assigned to other functions in government service.

Bureaucratic procedure varies throughout the region, but there are several aspects which have an adverse effect on efforts to raise the status of agricultural marketing. These characteristics do not apply solely to marketing, but because of the "newness" of the enterprise they are particularly relevant. For example, the heads and other members of the agricultural marketing section are often reluctant to forward data which may run counter to the opinions held by their superiors or to government policy. Marketing staff are often reluctant, even when funds are available, to study problems at first hand. This is sometimes the result of poor or inadequate training, but it also reflects a paternalistic government attitude toward agriculture in general. The reluctance stems also partly from the conviction, often valid, that superiors will not read or act upon the findings of a field study. The most challenging publications and reports on agricultural marketing and, in particular, those demonstrating a more objective approach usually originate from international workers or from national groups associated with institutions independent of governments. Unfortunately, the range of these studies has not been very wide to date, and in many instances foreign advisers attached to aid-giving agencies have also tended to maintain the "status quo approach."

Some Commonly Held Notions

Officials are generally convinced that they are well acquainted with the structure of the marketing systems in their own countries. This is far from true, as the localized complexities of traditional marketing systems are such that no one understands them completely, and their intricacy is sufficient in many cases to deter even the most avid researchers. On the other hand, the specialized technical and managerial requirements of a modern integrated marketing system also place government officials at a disadvantage. Notions of agricultural

marketing held by policymakers and researchers are often based upon inaccurate information, or at best half-truths, bequeathed over many years and accepted without question. Over time and by constant repetition, they have become "facts," and even some international research and advisory workers have made the mistake of accepting them uncritically. The following notions, which need to be corrected or modified, are among the most erroneous, and they retard the development of a more objective approach to agricultural marketing in this region.

1. The middlemen. Attack on the free enterprise competitive marketing system centers on a broad group of people and/or institutions falling under the vague term of middlemen. The intensity of feeling against this group, which provides essential marketing functions and services, seems often of staggering proportions to those attempting to keep an open mind on the subject. Conversations with government officials at all levels reveal the intensity of feeling against this group and, in fact, mere mention of the term creates an impasse in any discussion of the marketing system. In some countries, the feeling toward middlemen may be a reflection of the attitude by nationals toward commerce in general, for example in India. In others, the dominance of the marketing system by aliens has sharpened emotional reaction; for example, the role of Chinese nationals in Thailand, Malaysia, Indonesia and the Philippines.

It is difficult to comment on the accusation that middlemen pay the farmer a price lower than the "real value" of the product--a common complaint in all countries of the region. Seldom is the concept of real value defined. That farmers are sometimes paid low prices cannot be denied but it is far from a universal fact. Often the middleman is the first to bring the producer into the money economy, in fact he alone often creates the market. His pioneering activities would warrant higher profits for the services he performs, but these gains also attract others.

Few middlemen actually have the power to pay the farmer low prices at even the village level, as competition among traders is almost a normal feature of the marketing of agricultural products. Often the form of competition is not based on price but in terms of services rendered to farmers. Notable among these are services designed to retain the loyalty of producers and to attract new producers; for example, the provision of information on prices, credit arrangements with local stores, direct credit to farmers, free board and lodging, etc. It is also assumed that the middleman always has, or is able to obtain, almost unlimited funds; but some, particularly those from the villages, are faced with the same problem as the producer, namely, inadequate finance to cover a full range of business activities, such as storage, for example.

A major criticism levelled against middlemen is their alleged ability to manipulate prices. It is also maintained that the seasonal variability in prices is almost entirely caused by their speculative behavior; the term is never defined precisely. Relatively simple models of the cost of holding produce over varying lengths of time, using official price data, can often raise doubt regarding the allegation that storage of important foodgrains for speculative practices always results in profit. Nevertheless, the storing of produce to permit normal business activities is automatically associated with anti-social behavior. The fact that the practice of buying supplies during the surplus period of the immediate post-harvest to hold them until the period of relative scarcity later in the season affords benefits to both consumer and producer is rarely considered. Increased purchasing by traders in the post-harvest period forces prices up, thus benefiting producers. Release of stocks during the high-price period later in the season has the effect of increasing supplies and so lowering prices, to the benefit of the consumers.

There is at least some evidence to suggest that producers are very often satisfied with the prices and services provided by middlemen. An examination of a large wheat market in the Punjab of India showed that the market was highly competitive and served effectively as a pricing signal for producers, and that prices reflected supply and demand conditions very well in the areas where government food-zoning regulations were not operating. The study tended to contradict almost all the preconceived notions of the role of middlemen in the marketing of foodgrains in India. Also, according to R. J. Muscat, in Thailand: "One conclusive, if frustrating, proof of the competitive nature of the maize trade was the complete disinterest of maize farmers in Pakchong in efforts of the Ministry of Cooperatives and the U. S. Operations Mission to form a maize marketing cooperative. The proposed cooperative was specifically rejected by the farmers in favor of continued reliance on the competitive maize middlemen."

Accusations of collusion among middlemen, irrespective of the size of their operations, are common. Evidence that this is not universal is increasing; their large number is in itself a condition which does not favor collusion. This practice does occur but usally at points along the marketing chain where the produce is concentarted and a few large merchants operate. Collusion seems to occur in the export trade of many countries where the association of merchants, operating under government favor, controls the export of a number of commodities. Middlemen, however, are by no means undeserving of criticism; numerous examples can be quoted.

2. Lack of integration between markets. Stereotyped thinking about the various markets for agricultural commodities in developing countries tends to create the impression that they operate in a vacuum, that they are not related. This is often based on cursory studies of

price data for various district markets, which incline to show variations not explained by transport costs, etc. Many people assume that markets in developing countries are unrelated because at first sight there appears to be no apparent order in the system. Further inspection, especially of transport facilities, will reveal that staple commodity markets, and in particular those where interdistrict movement is important, are very much related, and that prices are formed competitively. Unfortunately, there has been little study on the integration of markets, although in some countries there is evidence to suggest that one large urban market may be an important mechanism for setting prices for certain commodities, particularly export crops. In Thailand, for example, rice prices in rural areas are closely related to those in Bangkok wholesale markets.

3. Low prices in the post-harvest period. Farmers in developing countries are often forced to sell their produce immediately after harvest, when prices are low. Prices always reflect, to some extent, the seasonal pattern of production in agriculture. That this situation has been true for many small-scale producers in the past cannot be denied, and that it still occurs in some areas of the countries of the region must be accepted. However, the position is changing rapidly, and it is most unlikely that it ever seriously affected the large-scale producers who provide the greatest proportion of produce which enters the marketing channel.

As a result of the diversification of agriculture, the structure of agricultural production has changed. Many farmers are growing cash crops which are harvested at different periods than their normal subsistence commodity. In this way, their income-earning pattern is materially altered, so that pressure to sell the subsistence crop immediately after harvest is greatly reduced. The impact of structural and production changes in agriculture is seldom considered in discussions on marketing.

4. Marketing margins. Marketing margin studies are one of the most popular undertaken by government marketing sections in the region but only limited use is made of them. Furthermore, they are used to illustrate the high cost of marketing, and serve as a device to point up the high profits of middlemen. However, an examination of the percentage of the retail price going to farmers in developing countries will show that the figure is exceptionally high compared to that in the developed countries. Little attempt is made to evaluate the marketing costs and margins in terms of the services provided in marketing channels. These studies have not even raised the serious question whether marketing margins are excessive in return for the services provided.

Another common contention is that traditional marketing systems are grossly inefficient. This uncritical view reflects a lack of knowl-

edge regarding these systems, which often operate efficiently despite their limited physical facilities and restricted finances. For many agricultural products, the marketing chains are effective and do deliver commodities to consumers at prices within their reach. R. C. Crotty notes that:

> Though the fixed capital and equipment used by the Malaysian livestock marketing system may be small in amount and rudimentary in character, the system does manage to market perishable commodities in one of the most difficult climates in the world with apparently little loss. What the marketeers lack in material equipment they apparently make good in versatility, adaptability and judgment. Without this last, given conditions where, in the absence of storage facilities, the market has to be cleared daily, either the merchants would have to carry the loss of surplus stock or prices would be highly erratic. The narrow marketing margins do not permit of such losses being absorbed by merchants and evidence suggests there is little resort to price variation to clear the market.

Remedial Action

It is difficult to localize a point of departure from which the first steps can be undertaken to make government decision-makers aware of the need for an objective approach to agricultural marketing. To date, agricultural marketing personnel have contributed little to the removal of false notions about their field of study. It has been dominated by people from other but related disciplines. Micro-studies can resolve the problem, since examination in depth can unearth important variations from preconceived notions. Such studies are expensive and time-consuming, but encouragement and the means to conduct research should be made available to government marketing sections.

Despite the somewhat negative picture that has been drawn here, there is a small cadre of personnel within the region, both national and international, who are conducting sound agricultural marketing research projects. These are often being done under difficult conditions, but the most serious factor hampering their work is the feeling that their efforts are not appreciated or understood by their superiors. Training is now being initiated by some multi- and bilateral aid programs, particularly to give staff members within the marketing sections the confidence which they need. The growing number of journals and publications on agricultural marketing within the region in both local and foreign languages is a reflection of this development. However, their circulation tends to be limited, particularly within government ministries and among other countries of the region. Greater publicity would do much to raise the status of the service.

The absence of specific agricultural marketing courses at the universities also contributes to lowering the status of the subject; this situation exists in many developed countries as well. Once the advanced educational institutions establish special studies in the field of agricultural marketing, acceptance by policymakers will be more rapid. Meanwhile, agricultural marketing sections can do much to help themselves. They can set about improving the technical quality of their staff by regular in-service training directed at specific problems. Similar programs should be designed to serve the middle-level workers, for example produce inspectors. In those countries where foreign marketing advisers are available, either with the government, at universities or other academic or research institutions, their assistance should be sought. Greater efforts can also be made to secure for these sections budgets and manpower allocations more in keeping with the range and complexity of their responsibilities.

The growth of new marketing facilities and services to cater for the expansion of modern agricultural techniques should point up the need for stronger marketing sections. There seems little doubt that more specialized marketing facilities and services will be required, such as bulk transport, larger and more sophisticated storage, drying and processing facilities, additional sources of credit for marketing studies of consumer resistance to particular commodities, new marketing institutions, adaptation to changing patterns in world and domestic trade, etc. Therefore, the marketing sections should be arranging their future work programs with an eye on their part in the planning, establishment, and possibly operation of these facilities and services. Research programs will have to include market development studies, and especially those involving feasibility studies.

It is essential for workers to go out in the field and study the marketing of various agricultural products in practice. While little is still known about existing marketing systems, enough information is now becoming available to permit the formulation of some hypotheses, many of which will question the validity of assumptions upon which agricultural marketing policies have been founded. The needs for empirical studies in developing countries are more pressing than in most developed nations because agricultural research workers in the former often have little feeling for agriculture and tend to isolate themselves from the farmer. This situation is even more true at the upper levels of policymaking.

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Agricultural Marketing in Nigeria and Ghana

Kurt R. Anschel

[Agricultural marketing has adapted remarkably well to expanding demands in West Africa, but will need considerable improvement if increasing food requirements of urban areas are to be met. Major changes are needed in the marketing of agricultural inputs, land tenure practices, and the availability of credit and transport.]

Probably the single most important phenomenon influencing West African agriculture is the rapid growth rate of urban centers. Cities which were either nonexistent or were only tiny hamlets at the turn of the century are now major centers of population. The population of Accra almost quadrupled between 1911 and 1931 and its 1960 population was five times the 1931 figure; Kumasi grew from 6,000 in 1906 to 221,000 in 1960. Lagos grew from 126,000 to 660,000 between 1931 and 1962, and many other Nigerian cities doubled or tripled in size. These rapid rates of urban growth have necessitated the development of an agricultural sector capable of supplying greatly increased quantities of food to the urban residents. The impact on the agricultural sector has been manifold: new opportunities have developed for selling agricultural products, and the rural economy has been integrated with the national economy. Introduced crops which are more conducive to transshipment have been adopted.

The marketing and transportation system has had to adapt to the necessity of handling a much greater volume of food in a given time period. At the turn of the century, with the exceptions of fish and salt, little food

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was traded beyond a few miles from its point of production. Thus, the agricultural sector, including its marketing institutions, has increased its capability for producing for the market and transporting food over long distances. There is no reason to expect a cessation of urban growth in the future, although the rate of increase is likely to decelerate; thus, increasing volumes of food will be required to feed urban residents.

A second major source of pressure for changes in agricultural production and marketing is the past and expected future increases in per capita income. A study of consumption patterns in three urban areas of Ghana indicates that the income elasticity of demand for food is extremely high, in the range of 0.7 to 0.9 (except for fish in one city) and that, surprisingly, the income elasticity of starchy staples is as high or higher than the income elasticity for meat. I calculate the income elasticity for all food in Nigeria to be between 0.40 and 0.93. These estimates make it obvious that the demand for food will continue to increase rapidly with increases in income. Quality of diet also improves as income increases. Many of the products with high income elasticities are more subject to deterioration and more expensive to transport; improved incomes will place pressures on the transportation and handling system for speedier and more frequent service. The volume of food produced and marketed will also have to be increased in response to increases in total population, which now grows at more than 2 percent per annum.

Agricultural Inputs

Land tenure. It is very difficult to generalize about the impacts on agricultural productivity of the West African communal tenure system. The West African farmer in most areas may farm as much land as he needs to support his family; as long as he regularly uses the land, it belongs to him and his descendants. Although the tenure system is called "communal," in fact it is little different from Western tenure practice, with one major exception: the farmer may not sell land. In the final analysis, although every member of the community may use the land according to his needs, he does not have the right of alienation. In Ghana, however, it has become common practice for chiefs to sell stool (undistributed, communal) lands. The bulk of the funds thus derived flow into the community treasury, but usually the chief may retain a portion for his own purposes.

Fragmentation may become a serious problem in the future. Currently, because each family only cultivates what it can clear with its own labor plus a small amount of hired labor, plots tend to be small (about three acres) and scattered. Inheritance often compounds this problem, but at the present time about the only cost is the time required to move from parcel to parcel. In the future, when widespread

mechanization of production becomes feasible, problems created by the dispersion of holdings will be magnified.

A second problem generated by the tenure system which may assume greater importance in the future is the restriction of land allocation to natives of the community. In practice, it is common for strangers to be allocated land for growing annual crops, but usually they are strictly forbidden to plant perennial crops until after they have been accepted as permanent residents. As the region develops and as mobility increases, this may become a rather serious impediment to the efficient allocation of land.

While the land tenure system is disfunctional for the reallocation of land, either between farmers or from agriculture to other uses, it would appear that West Africa does not suffer from problems caused by an imbalance of power derived from land ownership.

Ownership of economic trees. Trees that are planted and cultivated are usually the property of the planter. But even though an individual may own the trees, he may not own the land under the trees; once the trees die, or are cut, the land reverts to its former status. The separation of land ownership and tree ownership implies a reluctance to invest in capital which cannot be recovered before the trees die. Although land cannot be sold, cocoa trees are actively traded in Nigeria and Ghana. Rubber trees in Nigeria, however, are only rarely sold. This may be due to the relatively recent establishment of the smallholder rubber industry. Although rubber and cocoa were both introduced into Nigeria and Ghana at the turn of the century, smallholders did not plant significant acreages of rubber until the mid-1930s. Cocoa, on the other hand, was immediately adopted and has been an important crop in both countries since early in this century. Oil palm ownership patterns are changing rapidly, but in many areas oil palms remain community property that may be harvested by anyone from the community who wishes to do so. In these communities, it is foolhardy to plant high-yielding palms because the individual has no means of preventing others from harvesting the palms he has planted.

In many areas of Nigeria, population pressures are causing land shortages and shortening of the bush fallow period; in Midwestern Nigeria, land is becoming increasingly scarce because so much land is devoted to rubber. Some villages have even prohibited further plantings of perennial crops.

Capital markets. Purchased capital is at present a minor cost in the productive process of West African agriculture. The major forms of capital are land and trees, but land is free and trees are home produced. Purchased capital represents only 5 percent of the total cost of rubber production in Midwestern Nigeria, and land, buildings, and

equipment represent less than 25 percent of the total cost of establishing cocoa in Western Nigeria. Undoubtedly, the capital costs of food crop cultivation are lower still, since even less equipment is required. Nevertheless, indebtedness is common throughout the former British West Africa; the debt load, however, is light relative to income, and consists mostly of short-term loans. Interest rates vary from zero for some loans from family and neighbors up to between 50 and 100 percent paid to traders or moneylenders.

Perhaps the most serious obstacle to providing adequate credit facilities is the inability of the farmer to mortgage his land under the traditional tenure system. Since farmers generally cannot provide collateral, commercial banks do not lend to them. Short of totally revising tenure practices or being patient enough to wait for tenure traditions to change, a new credit system will have to be instituted. Obviously, the existing credit system is inadequate for a modern agriculture. Interest rates are so high that it is difficult to find productive investments which justify borrowing money. Although currently the credit market is probably competitive, it is obviously inefficient, and with further commercialization and increasing needs for capital, monopsonistic practices are likely to be added to the present inefficiencies and capital shortages.

The governments of Nigeria have attempted to remedy the lack of private sources of low-interest agricultural loans by supplying public funds for this purpose. However, in the past these funds have been totally inadequate. Only 4 percent of the farmers in Western Nigeria have benefited by a loan from government loan funds; only 28 percent of those qualifying for loans have actually received them. Cooperatives in Western Nigeria make short-term, low-interest loans to members, but these have proved unsatisfactory because they are unavailable at the time of the year when loans are most needed and are often insufficient to cover the projected expenditure.

Input markets. The physical inputs of agricultural production--hoes, knives, pails, etc. --are sold both in stalls in the market places and in local general stores, often by the same men. Input dealers are usually small traders who sell numerous other products in addition to inputs. Typically, they respond to the demand of their customers by supplying the traditional tools and supplies of the area and seldom introducing new, more productive practices. Their educational role is minimal. Only after the Ministry of Agriculture or a similar organization has introduced new practices to the farmers wil' the traders respond by supplying the associated inputs.

Agricultural Produce Markets

West African market places (bazaars) fall into three functional categories: local markets, assembly markets, and urban markets.

Local markets are rural points of initial sale for most farm produce entering the market stream, and also serve as the final point of sale of some imported manufactured and processed goods. Assembly markets are also rural, and some produce enters the market system for the first time when sold in these markets. They service the consumption needs of the local population, as well as being points of exchange between traders who purchase goods at local markets and those who sell produce in larger assembly markets or in urban areas. The final point of destination of produce is the urban markets. Here traders sell small lots of produce purchased in assembly markets to retailers. Urban markets also act as the distributing center for goods imported from overseas and from other regions of the country.

Export crops do not pass through the market place, but are purchased instead by middlemen specializing in the trade of a specific product. Most products (other than rubber) are then exported and controlled by marketing boards which designate and license buying agents who purchase the crop and resell it to the boards. The boards establish prices to be paid by the licensed buying agents as well as the price which they will pay to the agents. The system has operated to the disadvantage of the farmer because marketing boards retain such a high proportion of the export value of the crops.

Nigerian rubber is sold by middlemen to processors who mill, grade, and export. The middlemen pay the producers a fixed price for their rubber regardless of quality. By adulterating his latex with sand, sticks, and small pebbles, the producer is able to increase the weight sold without affecting his price per pound. Only a few firms buy and export rubber--approximately thirty in 1964. The result is production of the lowest grade of crepe rubber sold on the international market. Furthermore, there is considerable excess capacity because of indivisibilities in milling and drying facilities. The result is an oligopsony regulated by a trade organization. The trade organization has prevented price wars, but it has not been able to enforce reforms in buying practices to improve the quality of the product. The individual firm cannot introduce price differentials for grades, because initially the costs would be extremely high; but once a significant supply of high-quality rubber was developed, other firms would start buying it, thus preventing the innovator from recouping his earlier losses.

Sales technique and price determination. The foreigner often characterizes the African marketplace price determination process as bargaining or higgling. The implicit assumption is that prices are arrived at competitively via give-and-take between buyer and seller. Yet, there is mounting evidence that this may not be a complete or even accurate characterization. Several authors have reported the existence of trader groups organized around product lines and which

meet daily to determine prices. Although the predetermined prices are voluntary (no social sanctions are applied to those who sell below the agreed minimum) and prices reportedly often decline at the end of the day, this still implies imperfectly competitive markets. Possibly, higgling represents an attempt to obtain a price higher than the agreed minimum by discovering whether the buyer knows the "right" price. The recognition of mutual interdependence implies that individual sellers are reluctant to break the price agreement for fear of retaliation; only the sellers of highly perishable products are likely to lower prices. When one moves from the consumer bazaar to the wholesale level, however, there is no evidence that the markets are other than competitive.

Handling and transportation. Before a product is consumed, it may be sold as many as a dozen times. From the producer it goes to traders who assemble it into larger and larger lots for shipment to the place of consumption. At the consumption point it may be sold several times as lots are broken. Many items are sold in single or very small units. Cigarettes and matches are often sold one at a time; rice may be sold by the cupful. Western economists tend to be critical of the obviously high labor requirements that frequent exchange entails. But this system has some real advantages which are often overlooked: 1) Capital is conserved, since each retailer maintains only a very small stock; little capital is tied up in inventory or buildings. 2) Large amounts of labor, the cheaper input, are used relative to capital. 3) The buyer is able to purchase very small quantities.

A major bottleneck in the transportation system appears to be the lack of feeder roads from farm to market. Currently, women carry produce to market by the headload. The maximum quantity an individual woman can carry is about 80 pounds; even smaller quantities of fragile and porous goods can be carried. Because of limited carrying capacity, the women must make frequent trips to market; in parts of Western Nigeria the women are already going to market almost every day. As urban population expands relative to rural, and, presumably, production-per-farmer increases, the upper limit in the carrying capacity and supply of women may be reached.

Credit. High rates of interest prohibit the use of credit by traders generally, even in the wholesale markets. Banks only rarely provide credit to traders, and then only to those well known to them. The future development of the rural sector will necessitate strengthening of the credit system as increased volume per trader requires the greater use of credit.

Social functions of the market. In a society that is still largely illiterate, markets are a primary site for communication. They are

places for courtship, religious services, political activities, and meeting family and friends. To quote one authority, "... trading must be considered as much a social activity, a use of leisure time, as a strictly economic one; a woman may consider the day well spent if she takes garri to the market and spends a sociable day there while consuming most of the garri herself."

In conclusion, it is clear that the agricultural markets of Ghana and Nigeria are highly functional social institutions. They have grown over the past 100 years from essentially local points of exchange to links in a national network capable of supplying large urban populations with imperishable staples. Food now travels 100 miles or more passing through innumerable markets before reaching the major urban centers. Obviously, these markets have successfully translated urban demand to the producer at prices that were sufficient to stimulate production for the market. Both regional and local specialization have been facilitated.

But the market structure is not without its limitations. Credit is expensive and insufficient. Land tenure practices discourage transfer of assets to the more efficient producer, prevent the use of land as a collateral for credit, and encourage the production of tree crops as opposed to annual crops beyond the dictates of the market. Input markets are not well adapted to provide producers with educational services (i.e., to introduce innovations) as well as goods. As the volume of goods passing through the market increases faster than the farming population, major transportation problems will probably be experienced between farm and market. Credit facilities for traders are undoubtedly inadequate even in today's environment and will be a considerable restraint in the future as volume increases. Undoubtedly, the market structure will be modified as these countries develop further, and the problems listed indicate areas where changes should be carried out.

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Marketing Problems in Africa: Constraints on Agricultural Development

William O. Jones

[The major deficiency that emerged from a comprehensive study of marketing in several African countries was the lack of staple food wholesalers capable of trading on a nationwide basis. This has had far-reaching, often erratic effects on the distribution of food supplies as well as agricultural production.]

Beginning with my visit to the southern Congo in 1953, I have found many opinions and allegations about imperfections in farm marketing, ranging from concern over the Africans' naiveté to charges that lack of farm storage facilities forced farm surpluses onto the market immediately after harvest at ruinous prices. On the other hand, there was impressive evidence that African food supplies had increased with population, sometimes faster than population, throughout the 20th century, at a time when export crop production was growing steadily and large numbers of Africans were being drawn into non-farm employment. This seemed to imply rather clearly that in many African countries internal marketing systems for staple foods were working well enough to call forth increasing supplies as they were needed. Beyond that, however, very little was known with any degree of assurance. Traders might be exploiting farmers, consumers, or each other; prices might behave erratically from day to day, week to week, or month to month; surpluses might exist in some places simultaneously with severe shortages elsewhere; storage might in fact be short and fluctuations in seasonal prices excessive; market demand might be insufficient to support smoothly operating distribution systems; and farm-to-consumer price spreads might

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be exaggerated by long marketing chains with redundant intermediaries. There was no firm evidence.

We set out to learn more about African food marketing. With the U.S. Agency for International Development's (AID) assistance we were able to examine carefully, over a period of 14 to 17 months, the operation of marketing systems for major staples in five areas of tropical Africa: the food supplying hinterlands of Freetown, Nairobi, Ibadan, Enugu, and Kano. We found many of the allegations about imperfections in the marketing systems not to be borne out by the facts. Storage costs and seasonal price movements in general appeared moderate; the farmer's share of the consumer's dollar high; the marketing chain short, probably too short in fact; trading margins, so far as we could determine them, seemed reasonable. Imperfections in the dissemination of market information, the great variation in units of measurement, the lack of recognized quality standards and of formal contracts were not as crippling as we should have expected. On the other hand, one glaring deficiency showed up in all of the studies, and that was the general absence of wholesalers with capacity to trade in the staple commodities on a national basis, and a consequent malallocation of supplies over time and space.

This situation is both consequence and cause of the very imperfect reticulation of the economic network that should bind a national economy together. It is in part a consequence of cultural fragmentation of the African countries, but in part also a consequence of government's attitude toward commerce. It is self-reinforcing; imperfections in allocation of staples over time and space make the rural producer reluctant to rely on the market for much of his staple food requirements, so that in many places the market is too thin to permit it to operate efficiently. The tendency to own consumption also reinforces the customary practice of storing cereals on the farm, with the consequence that the magnitude of marketable supplies is extremely difficult to determine until they are actually offered for sale, which may be near to the end of the crop year. The general recommendations which come out of the study are principally concerned with steps that the national governments might take to help wholesalers develop national systems of trading relationships.

Study of the staple food markets also directed our attention to the ways in which an agricultural marketing system can facilitate or impede development, both in farming and in the non-agricultural sectors. In Sierra Leone, for example, the sample survey of agriculture taken in 1965/66 reported that only 5.5 percent of the total rice crop was sold, although rice is the preeminent staple, and that about half of all domestic rice marketed came from the Scarcies area. This is also the area of greatest concentration of licensed rice dealers. It is at least worth investigating whether the paucity of licensed dealers in other rice-growing areas has limited production for market, and

whether government's efforts to increase rice production might better be concentrated in areas already served by a well-developed market mechanism.

The Western Nigeria study points to somewhat analagous possibilities. Oyo Division, which lies north of the cocoa-, kola-, and oil palm-growing areas, appears to have become the major supplier of yams, gari, and maize to the large Ibadan market, although it lies far outside what might have been thought of as the normal Ibadan hinterland. Might not there be an opportunity here for government to stimulate further development of this potential bread basket and to enable farmers to the south, who already purchase more than one half of their staple food requirements, to concentrate more on production of export crops in which their comparative advantage is greatest? This sort of specialization not only lowers production costs, but, by permitting the farmer greater choice in consumption it also increases his well-being, and his effective demand for non-agricultural goods and services.

The importance of scale economies may be illustrated by the experience in Sierra Leone when foreign traders were expelled from the rice trade. This "big" trade had carried with it a "little" trade in peanuts, which was not large enough to support itself. In the period after the eviction of the foreigners, who had traded nationally, the peanut trade appears to have more or less fallen apart. Something similar may have happened in Uganda, where government control of the "big" cotton trade probably inhibited experimentation in other "little" trades.

The direct impact of marketing policy on manufacturing is best illustrated from Kenya, where there are said to be from 2,000 to 5,000 small water-driven corn mills. It might be expected that these would provide a breeding ground for small manufacturers and for entrepreneurship, as they did in Western Europe and the United States at an earlier date. That they have not must be due in no small part to governmental regulations that forbid such millers to deal in corn or cornmeal, or even to take a share of the product as payment for grinding.

[Excerpted from "Marketing Problems as Constraints on Continued Agricultural Development," a statement delivered to the AID-U.S. Department of Agriculture Seminar on Improving Food Marketing in Developing Countries, 18-19 June 1970, Washington, D.C.]

Penetrating Rural Markets

V. G. Rajadhyaksha

[A large and progressive private company has been engaged for some years in a pioneering campaign to sell its consumer products in the Indian countryside. While this has cost more than most companies could afford, the fact that farmers today are increasing their disposable incomes may give such exploratory efforts by others a better payoff in the future.]

The vast potential for marketing in rural India is now beginning to be seen not as a remote promise, but perhaps a more immediate opportunity. What has brought about this change in outlook? The record agricultural production of the last two years has changed attitudes a great deal. More than the increase of production, which after all was only a few percent overall, what has come as a surprise to the country is the enthusiasm and extent to which new agricultural practices have been accepted. Given the right products, presented in the right way, the image of the farmer as a tradition-bound, unenterprising individual reconciled to his poverty-stricken existence has begun to fade.

The Challenge

Rural marketing is a new and exciting challenge. The goal is the 565,000 Indian villages, the vast majority of which are very small in size. Over 60 percent have less than 500 people each, and account for about 20 percent of the rural population. Nearly half the rural population lives in medium-sized villages with 1,000 to 5,000 persons. As a company, Hindustan Lever is not entirely new to the job. As long ago as the early fifties, distribution was expanded and taken to the rural communities where development expenditure under

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the national Plans was likely to generate a demand for our products. This often took us beyond the conventional facilities of rail transport and the banking system. A network of clearing and forwarding agencies was established all over the country, from where the transport of goods by road within an economic radius could be organized. Dealers were persuaded to open bank accounts in nearby towns and were paid their expenses every time they made the journey to settle their accounts for a dispatch made to their village.

For the sales force too new means of travel were introduced--company-owned sales vans--in areas where public transport was nonexistent or irregular. As communications improved and these villages could be reached and fed through conventional transport, the vans went deeper to pioneer another set of markets. In this way, over a decade and a half, not only has some business been built up but, what is more valuable, an insight into the techniques of operating beyond the developing infrastructure of the urban economy has been gained.

Several thousand villages with populations as low as 2,000 are now served by sales vans. One problem was the absence of any kind of shop in some of these smaller villages. Selling from the van itself, which could visit the village only five or six times a year, was clearly not a satisfactory solution; so dealers in the larger towns were persuaded to open branches, particularly in those villages where they had relatives. The result of all this effort is that our leading brands are now sold through some 300,000 shops all over the country. Even so, we cannot say we have traveled very deep into the heart of the rural market.

The very high cost of distributing products to such a rural market cannot be ignored. A sales van costs 2 1/2 times as much as a nonmechanized salesman, and the outdoor selling cost per unit of sale is 17 times as great. Distribution costs are higher, not only because distances traveled per unit of sale are so much greater, but also because the heavy wear and tear on sales vans plying on rural roads and the absence of backloads escalate costs.

Motivation

Our experience in rural selling soon proved that the existence of a disposable income, though essential, was not by itself sufficient; some way of motivating the villager had to be found. There were no newspapers or cinemas to advertise in; in some cases the products themselves were unknown. Cinema vans were developed which showed popular films and also advertised and sold our products. To improve their utilization, entirely new equipment was designed which would allow cinema shows to be held in broad daylight in the open air. The demonstration van put on puppet shows to attract the audience and then showed how our products should be used. While there can be no doubt

that such vans are highly effective motivators, like sales vans they are extremely expensive. The estimated cost of reaching a rural cinema van viewer is about 25 paise compared to 0.2 paise for an urban one [3.5¢ and .028¢]. Applying shorter term economic yardsticks, the cost of advertising and selling through vans low cost consumer products such as ours is high in relation to the sales they bring in. It can only be justified by the belief that this operation creates an awareness and a demand for our products, which in due course will be met by the trade through its primitive but cheap and efficient channels.

Strategy for the Future

With the experience of 15 years of rural selling as a guide, the strategy that would make the best use of the new opportunities that the rural market would offer in the future had to be selected; whether, for instance, to be selective in the choice of regions and districts, or repeat the pattern of the past and extend distribution on an all-India basis. An examination of the agricultural statistics clearly revealed that agricultural productivity was growing much faster in some districts than in others. Wide variations exist in landholdings and in the size of families. All these factors pointed to a selection approach. But, while districts which were likely to have a steady or rising disposable income could be spotted in this way, little was known about the size of the surplus or how it would be spent.

We decided to carry out a socio-economic survey of four districts where agricultural prosperity had augmented disposable incomes. We chose Junagadh, Ludhiana, Shahabad and Tanjore--one district from each part of the country--and undertook an intensive inquiry. A team of economists and market research staff visited hundreds of villages and questioned a wide corss-section of the village community. The results were interesting; it became apparent that, even among the so-called prosperous agricultural districts, emphasis would have to be placed on those which not only had relatively high per capita incomes today, but also where the benefits of increasing productivity in the future would not be offset by other factors.

Equally revealing was the way in which the new income was spent. A generally similar pattern emerged: the first change was understandably more and better food, and in the four survey districts this took up about a sixth to a quarter of the additional cash income. The largest share in all districts, however, varying from 25 to 60 percent, was devoted to farm inputs--tubewells, pumping sets, fertilizers, new or better implements, hybrid seeds, grain storage, etc., and housing. Having provided for his family and his farm, the farmer is now anxious to raise his status in the community. Thus, expenditure on weddings absorbed a further 8 percent of his incremental income. Next in priority came consumer durables--bicycles, transistors, furniture and watches. In Ludhiana district 85 percent had bicycles, 52 percent

possessed sewing machines and 51 percent radios/transistors. In Junagadh 45 percent owned watches, 40 percent bicycles and 30 percent transistor radios. Elsewhere the picture was similar.

Our products, soap, vanaspati and other packaged goods, came at the end of the shopping list. In some cases this was because the shortage of our more popular brands made continuity of supply to the villages difficult. Nevertheless, it became clear that unless we could find new ways of communicating with the farmer regularly--the occasional visit of a sales or cinema van was not enough--and change his attitudes and priorities, a dramatic rise in the rural demand for our products could not be expected.

Communicating with the Villager

What are these new ways? Although newspapers are still rare and adult illiteracy is widespread, there is growing up an increasingly literate youth. In the four districts surveyed, between a third and two thirds of the families had children at school. The written word, whether it is used for advertising in the press or on signs, on merchandising materials or on the container, would thus have to be addressed largely to the younger generation with their expectations and their aspirations in mind.

Today, the only practicable means of reaching a significant proportion of the village population is through radio. With 30 to 50 percent of the rural population in these well-to-do rural communities owning radio sets, the problem is to achieve a high level of listenership. The rural programs put out by All India Radio, couched in the style and idiom of the neighboring village community, have shown how successfully this problem can be solved. What is now required is to increase the range of the existing broadcasting stations and to set up new ones, particularly in the more progressive farming communities. The demand on commercial broadcasting time already far exceeds availability, and the cost of strengthening and widening the network could be met from the revenues. Commercial revenues could also be used to recover the large initial costs of extending a television network. Television is potentially the most powerful means of communication; it could make important contributions to a wide range of developmental activities.

The whole area of motivation is a fascinating one and techniques which are dramatically effective in one country may not be so in another. For instance, the Sears Roebuck catalog expanded the rural American market by, to use W. W. Rostow's words, "giving the American farmer a vision of what he could get to raise his productivity, and giving his wife a vision of what she could get if her husband did these things." This is not to say that catalogs have worked equally well

elsewhere or will work in India, but comparable ways of motivating the Indian farmer could be found.

Product Development

We will also need to take another look at our products and market strategy. Some clear preferences--low unit price, for example--already distinguish the rural from the urban consumer. Moreover, while urban communities, as they develop, tend to become increasingly similar to one another in their buying habits, our survey shows that rural consumers, in contrast, tend to be much more subject to local religious, cultural and social pressures, and vary greatly from region to region. Hitherto, with the preponderantly urban character of our present market in mind, our products and marketing strategy have paid little attention to regional variations in tastes and habits. It may well be that one of the keys to success in the rural market would be to take increasing account of these regional preferences in the designing, formulating, packaging and advertising of our products. Periodic marketing surveys are required to establish whether the products are right, whether the prices are right, which of the various media is the most effective, what kind of advertising story has the greatest appeal, and so on.

Brakes on Rural Marketing

Developing rural markets involves substantial investment in distribution, advertising and market research, with the rewards, if any, coming many years later. We as a company have made these investments in the past and will continue to do so in the future. However, under the tight price controls which apply to some of the common consumer products, this investment becomes increasingly uneconomic. If the rural market for these products is to develop the needed tempo, these controls will have to be relaxed or removed. Likewise, tax relief on expenditure incurred in the development of rural markets would give the rural marketeer much psychological and financial stimulus.

Nothing will so quickly destroy the farmer's natural or created desire for consumer goods as variable quality and prices. He will become a regular consumer like his urban counterpart only if he can get consistently good quality at steady reasonable prices. This is preeminently a field in which the larger companies with their economies of scale, technological and research skills, and their reputation for quality can acquit themselves well. It is also these larger companies which have the experience, skill and resources to tackle the vast rural market, and the capacity to wait for their returns. It would be a pity therefore if, in spite of the growing demand for their products, such companies were not allowed to expand on the ground that they were already too "big."

Finally, large sections of the rural market are well outside the reach of the railways and the only access to them is by road. Such rural roads as there are tend to be generally poorly surfaced and many get severely damaged during the monsoon. On the road transport industry will fall a large share of the burden of opening up rural markets.

[Excerpted from "Hindustan Lever Limited, Speech of the Chairman, Mr. V. G. Rajadhyaksha, Rural Marketing in India," Economic and Political Weekly. Bombay: A Sameeksha Trust Publication, Vol. IV, No. 18, May 3, 1969, pp. 780-783.]

Comment on Rajadhyaksha's Speech

It used to be said that over large parts of the country the farmer was unambitious and little interested in improving his material standards to any substantial extent. This meant that he was unlikely to significantly increase his marketed surplus with which to buy consumer products manufactured in the urban areas. One reason for this attitude on the part of the farmer, to the extent that it prevailed, was lack of knowledge about and availability of consumer goods that go to make life more comfortable. It is here that aggressive rural marketing of consumer goods is closely related to more rapid economic change and development in the rural areas. By making such goods known and available in rural areas, the desire to increase the rural marketed surplus is created with its implications for increased productivity and readiness to use modern techniques.

Rural marketing should be of interest, therefore, not merely to manufacturers as a way to increase their sales but also to planners as a means of stimulating economic change. While much has been said about the tremendous potential of rural markets and of the need for manufacturers to organize for rural marketing, the mechanics of doing this have not so far been spelled out. It is in this context that the speech of the Chairman of Hindustan Lever comes as a refreshing change.

Hindustan Lever's experience in rural markets has been with consumer goods. The most difficult problem is that of communication. Lever introduced cinema vans which went into rural areas and exhibited advertising films. The cost was heavy and after more than a decade of this effort one would expect that some payoff must now have resulted. Sadly, Rajadhyaksha glosses over this aspect; one wonders whether Lever could have more profitably used this amount

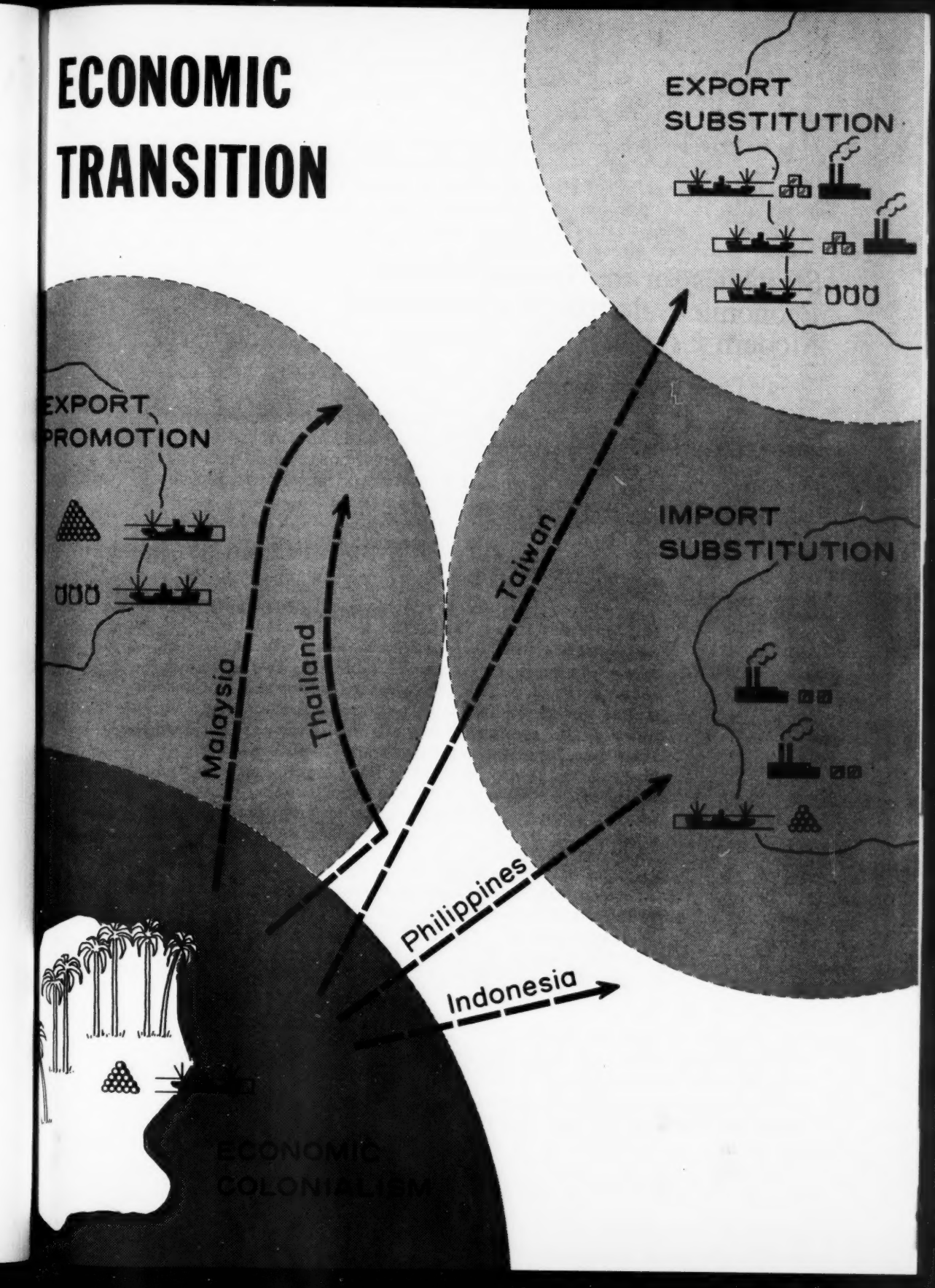
of advertising expenditure in rural areas as an extra investment in the growing urban areas. A suggestion which marketers of the size of Lever may consider is whether they should share such facilities as cinema vans in rural areas by renting them part of the time to manufacturers of non-competing products, so that their costs are reduced and the operation made viable within a reasonable period. At the same time, this will enable smaller manufacturers to enter rural markets without being faced with a level of expenditure that they cannot afford or can more profitably incur on the larger urban markets.

With the introduction of commercial broadcasting one more medium is now available to the rural marketer--though its use is still very limited. Other rural propaganda media used effectively by some cigarette and analgesic manufacturers have been puppet shows, men on stilts, clowns, wall paintings, etc.

It is wrong to think that the rural marketer has to create an entirely new distribution system of retailers and wholesalers. Traditionally, our villages have had a system of regular market-days, where people from a number of neighboring villages congregated to exchange their wares. Surely, a rural marketer who regularly covered most of these could be certain of wide rural penetration. These congregations are also excellent opportunities for his propaganda.

Lever used a system of clearing and forwarding agencies spread over the country at strategic locations and lorries and their own vans from thereon to deliver their goods. With road transport now well organized over most of the country, the problem facing the rural marketer is not so much the means of delivery as its high cost. Another means which cannot yet be used here is the post parcel; Rajadhyaksha rightly refers to the mail order business which opened up the rural market in the United States. The high cost of postal parcels and the uncertainties regarding prompt and secure delivery need to be corrected by the postal authorities.

[Excerpted from "Penetrating the Countryside," Economic and Political Weekly. Bombay: A Sameeksha Trust Publication, Vol. IV, No. 21, May 24, 1969, pp. 889-890. An Editorial.]


ECONOMIC
TRANSITION
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EXPORT
PROMOTION
IMPORT
SUBSTITUTION
Malaysia
Thailand
Taiwan
Philippines
Indonesia
ECONOMIC
COLONIALISM

Strategies for the Transition from Economic Colonialism to Sustained Modern Growth

Douglas S. Paauw

[The postwar experiences of five Southeast Asian countries, each starting with a colonial economic heritage and making its way with varying degrees of success toward modern industry and international viability, are analyzed in terms of transitional economic phases. Using this typology approach, and taking account of the nations' resource endowments, development strategies are worked out for meeting current and future growth problems.]

The problems of transition and growth in open, dualistic economies are examined in this study. Openness refers to the importance of foreign trade as an aspect of growth. An open economy is found where a large part of output (at least 10 percent of gross national product [GNP]) is produced for export. Openness in this sense is found almost universally among less developed countries of small and medium size. Only a few large countries have such a diversified resource base (Mainland China, India) that growth can center upon the domestic economy rather than foreign trade.

The term dualism, referring to the coexistence of modern and traditional elements in an economy, has taken on different meanings in development literature. Two uses of the term are relevant here--sectoral dualism and technological dualism, both having an important bearing on economic growth. Sectoral dual-

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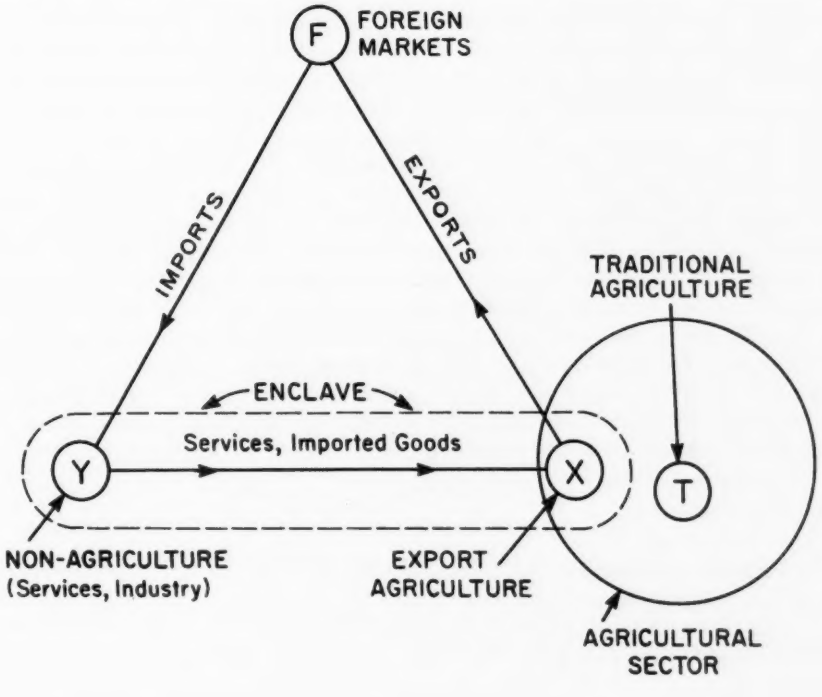
ism refers to the dichotomy between agriculture and industry, and the very different roles assumed by the two sectors during an economy's development. Technological dualism emphasizes the existence of a gulf between a traditional sector, where techniques of production are backward and unchanging, and a modern sector employing advanced technology. Such dualism may also be found within a single sector, notably in the differences between traditional and plantation agriculture.

A major concept is the transition from a "colonial" economy toward a modern growth economy. Less developed countries of the open dualistic type share a background of economic colonialism, even though some of them never lost their political independence, and some attained it in the 19th century (Latin America). Under this system the economy was compartmentalized into a stagnant traditional agricultural sector and an export-oriented, more modern enclave which included an agricultural export component and a non-agricultural sector devoted to servicing primary product exports. The two components of the enclave were linked through trade in a triangular pattern (see diagram), in which primary product exports provided foreign exchange for imports of consumer and capital goods by non-agriculture, which in turn delivered services and imported consumer

Diagram 1: Structure of the Economy Under Colonialism



goods to export agriculture. Growth within this pattern was externally dependent in that the foreign demand for primary products (and decisions by foreigners) governed whether profits would be used locally for reinvestment, leading to domestic expansion, or transferred abroad, producing stagnation. Independence, and a general upsurge of economic nationalism has caused the breakdown of the colonial economy system throughout the world since World War II. The resulting transition from the long colonial economy epoch toward a new growth epoch involves an evolutionary process of comprehensive social change, during which the system is displaced by new growth orientations.

At the time of decolonization, the society inherits an open economy, reflected in an externally-oriented enclave. This enclave is the key to launching transition growth. Primary product exports continue to serve as the source of the economy's profits and savings and its foreigh exchange; imports may now provide the producer goods for industrial expansion. But the nature of the industries which are built on this foundation can vary, not only in the goods that are produced but in the markets where they are sold. It is important to recognize that industrial orientation, i.e., the combination of products and markets, is an issue on which the society exercises choice.

Alternative Transition Growth Types

We may identify three transition growth types of industrial orientation: export promotion, import substitution and export substitution. With export promotion, industrial products are mainly of the servicing and processing variety, essentially inputs into the traditional export sector--normally agriculture, but including other extractive products like timber, oil or minerals--which provides the market. This orientation could include production of such modern agricultural inputs as fertilizer; it could embrace further processing of traditional goods for export, and also development of new extractive exports. A second industrial orientation--import substitution--represents more of a break with the colonial past: the industrial sector is oriented toward producing previously imported manufactured consumer goods for the domestic market. The third case represents an even sharper break with the past, as the industrial sector becomes oriented toward producing finished goods for export to the foreign sector. This orientation leads to export substitution, as the previous primary product exports are gradually replaced by industrial products.

Both export promotion and import substitution are sufficiently close to the colonial economy's mode of operation that either may represent a feasible system for launching transition growth from the colonial economy heritage. In both cases the industrial sector is

oriented toward a domestic market, so that the primary product export base continues to serve as the basic market stimulant for industrial expansion. Export substitution, however, represents a more complete shift from the colonial economy system, as the industrial sector displaces agriculture from its historical role as the dominant source of the economy's exports. This growth type, therefore, involves not only diversification of industrial products, but also industrial penetration into new markets beyond the domestic economy. These tasks impose high standards of efficiency and adaptability upon industrial entrepreneurs, as they enter the arena of world competition. For this reason, export substitution is unlikely to occur immediately after decolonization. Indigenous entrepreneurs must be offered an initial period of experience in the less competitive domestic market before they can compete successfully in international markets.

In the export promotion growth type, the economy as a whole is export-oriented, with the industrial sector indirectly promoting primary product exports; while under export substitution the industrial sector is directly involved in export expansion. Import substitution growth differs from these types by being exclusively focused upon the domestic market. In general, import substitution is limited by the size of the internal market. In addition, import substitution growth tends to reduce the economy's openness, as the industrial sector's growth replaces previously imported commodities, and this orientation usually results in policies which discriminate against and limit the expansion of export production. This emphasis produces built-in stagnation tendencies since, with relatively constant exports, the volume of imports to be substituted remains constant.

Both export promotion and export substitution growth, by contrast, are expansionary in nature. However, we must note that export promotion growth continues the colonial reliance upon land-based primary product exports, so that it can serve as a viable growth system only so long as a land surplus exists. Increasing land productivity may prolong such a surplus condition, but population growth will tend to reduce it. Many of today's less developed countries do not have a usable land surplus. Only a few of the presently developed countries (Denmark, New Zealand) relied upon this growth system for relatively long periods, and they have progressively increased the share of industrial value added, both in total output and in exports.

To summarize our discussion so far:

1) Internal Orientation:

Import substitution:	Expansion limited by size of domestic consumer market

2) External Orientation:

a. Export Promotion: Expansion limited by natural resource base

b. Export substitution: Initiation and expansion limited by entrepreneurial capabilities and labor force skills

Two types of factor are considered significant to the choices of transition growth types: the first are political forces unleashed by decolonization and independence, which shape the society's choice of the organizational system for the transitional economy. Typically, this choice lies between inward looking economic nationalism, tending toward import substitution, as opposed to an outward orientation built around export promotion. The second set of factors is in the material and human resource base (see below).

Our empirical study has been focused on a limited number of countries in Southeast Asia. Even among these countries there is considerable diversity in growth patterns, and also a great complexity in the factors and policies found in any one country. World wide, of course, the diversity is still greater. But we may simplify this diversity by identifying two contrasting organizational systems, and the policies associated with them, as in Table 1 (opposite page).

The organizational features shown in Row III must be consistent with the industrial sector's orientation which determines the nature of the growth type as a whole. Export promotion requires an organizational system conducive to effective competition in export markets and inducements to industrial sector promotion of primary product exports. Specifically, this involves free market allocation of resources, particularly investment decisions, import competition and free international capital movements--in short, a system dominated by competitive market forces, both externally and internally. By contrast, a major objective of import substitution growth is the encouragement of indigenous entrepreneurship to assume previously unfamiliar industrial roles. Entrepreneurial inducements typically take the form of market intervention to transfer savings on favorable terms, to provide protection from import competition and to prevent the economy's savings from being transferred abroad. The control system tends to be mainly concerned with foreign trade flows.

The emergence of one or the other of these contrasting organizational systems may be traced to the background conditions listed in Row IV of Table 1. The first condition, land surplus or land scarcity, is fundamental in determining whether a land-based primary product export growth system can become a viable basis for achieving national

Table 1: Major Features of Initial Transitional Growth Types

Major Features	Growth Types	
	Export Promotion	Import Substitution
I. Relationship to historical background	Continuity of colonialist pattern, reliance on foreign enclave	Economic nationalism; sharp break from colonialism
II. Industrial orientation	Servicing and accommodating primary product exports	Production for domestic consumer goods market
III. Economic organization	1. Free market system in allocation and investment decisions 2. Import competition 3. Free international capital movements	1. Controlled market system 2. Protection from import competition 3. Control of international capital movements
IV. Background conditions	1. Land surplus 2. Large modern enclave and small traditional agricultural sector 3. Scarcity of indigenous entrepreneurship	1. Land scarcity 2. Small modern enclave and large traditional agricultural sector 3. At least some indigenous entrepreneurs

development. The specific issue concerns whether the natural resource base is adequate, during the early transition years, to support growth and modernization throughout the economy from primary product exports--rather than merely supporting the growth of the enclave and profits to alien investors as in the past. Where colonialism left severe population pressure upon land resources, land-based primary product exports will not grow rapidly enough to serve as the basis for national development. Second, where the enclave sector is large in scope, affecting the majority of the society's population, reliance upon primary product exports is more feasible for developing the entire economy--if a land-surplus condition also exists. A part of the primary product export surplus may then be employed, through appropriate public policy, for the uplift of the relatively small, but backward, traditional agricultural sector. If, by contrast, a small enclave sector coexists with a large and backward traditional agricultural sector, even a land-surplus condition may not enable overall

development from the primary product export base. If land scarcity accompanies a small enclave and large traditional sector, reliance upon primary product export growth for national development is clearly unrealistic.

Choice between the two systems is also subject to constraints imposed by the supply of indigenous entrepreneurship, the third background condition. Two critical aspects of entrepreneurship must be emphasized. On the one hand, the continuation of a land-based export system imposes more severe requirements upon indigenous entrepreneurial capacities than the alternative because the export orientation involves competition in external markets. On the other hand, economic nationalism, in posing a sharp break with colonialism, requires a new class of entrepreneurs who must perfrom functions uncommon in the operation of the colonial economy. Economic nationalism provides a climate of protection from competition and a control system to assure profits, enabling inexperienced entrepreneurs to assume the new functions.

In many countries the colonial heritage poses the special problem of how to deal with alien versus indigenous entrepreneurs. In Southeast Asia colonial enterprise shared the entrepreneurial and managerial roles with Chinese and other resident minority groups, in some cases to the virtual exclusion of indigenous peoples. With export promotion, a compromise with alien entrepreneurship is required, since indigenous agents are unable to take over operation of the competitive export economy. Growth under import substitution imposes less demanding entrepreneurial requirements; but the system transfers vast resources to new industrial entrepreneurs, and such transfers are often politically unpalatable unless there is an adequate supply of potential indigenous entrepreneurs to become the beneficiaries. Where both land supply and entrepreneurial conditions are unfavorable, and where a compromise with alien entrepreneurs is politically infeasible, economic nationalism is likely to lead to chaotic early transition growth.

Transition Systems in Southeast Asian Countries

The transition experience of five Southeast Asian countries in 1950-70 may be reviewed using our classification of growth types. Malaysia and Thailand fall into the export promotion category, while Indonesia, the Philippines and Taiwan exemplify import substitution. In Taiwan, import substitution was apparent during the first decade of the transition, but gradual modification of the system toward export substitution followed in the 1960s.

Malaysia. Malaysia achieved independence in 1957 with a relatively favorable land-population ratio. The availability of land for expan-

sion of primary product exports presented no barrier to continued growth reliance upon a primary product export base, in fact the land devoted to primary export production has increased substantially since 1950. This land-surplus condition was inherited in conjunction with a large enclave sector, involving productive activities of the majority of the labor force, and a relatively small traditional agricultural sector.

The second conspicuous background factor in Malaysia's heritage was a complex division of labor among the society's ethnic groups, reflected most importantly in the supply of entrepreneurship. Three contending groups may be identified: the former colonial group, the Chinese and Indian minority, and the indigenous Malays. The ex-colonial (British) aliens were primarily involved in management of primary product production and export activities. Chinese and Indian minority groups were involved partly in the export sector and partly in domestic commerce. Indigenous Malays, by and large, were confined to the traditional agricultural sector, with some providing labor services for the enclave. From the viewpoint of the Malays, independence produced a politically volatile situation with these characteristics: 1) domination of entrepreneurial roles by aliens, and a lack of indigenous entrepreneurs; 2) resentment against the superior economic roles of alien (Chinese and Indian) minority groups; 3) the confinement of Malays to traditional agricultural roles; but 4) Malayan control of political power.

The abundance of land and the absence of an adequate indigenous entrepreneurial class reinforced each other in encouraging the continuation of a colonial-type economy with minor modifications. A compromise arrangement between alien and minority group entrepreneurs and the indigenous Malayan political leaders emerged to provide a political framework and the appropriate organizational milieu for export promotion growth. While alien entrepreneurs continued to operate the primary product export economy, the national government--representing Malayan interests--pursued a program for national development with heavy emphasis upon agriculture. A share of primary product export profits has been made available, through taxation and other policies, to promote modernization and expansion of the traditional agricultural sector, and to improve the welfare of Malays. In addition to reducing the nation's food deficit, the purpose of these programs was to gradually improve the economic capabilities of the indigenous population, so that the Malays could eventually assume more entrepreneurial roles.

Both agricultural and non-agricultural output, along with export volume, have so far been growing successfully and at similar rates; gross domestic product (GDP) rose by 5.8 percent annually in 1957-67. Industry has so far been very largely dominated by export pro-

cessing, but initial import substitution has begun in West Malaysia. Diversification of land-based exports, using resources in East Malaysia, is also underway.

Thailand. Despite the absence of political colonization, Thailand exhibited all the economic features of colonialism as described above. Thailand's stirrings toward modernization occurred somewhat earlier than in the neighboring countries in the absence of foreign political control. The first transition phenomena focused on attempts to weaken the economic control of (Chinese) aliens associated with the colonial-type primary product export economy. Beginning in the 1930s, political power was employed to create modern development roles, of the import substitution variety, and reserve them for Thai nationals largely in state enterprises. This first attempt at transition failed; by the early 1950s a reversal was apparent, and gradually export promotion became ascendant. Early import substitution failed in generating a transition because it was not consistent with Thailand's particular heritage from economic colonialism. Thailand's background conditions, briefly, are the persistence of a basic land surplus, the presence of a moderately large modern economic enclave, and the domination of entrepreneurial roles by aliens to the almost complete exclusion of Thais.

During the 1950s political decisions resulted in policies conducive to a new transition firmly based upon export promotion. The industrial sector became reoriented toward the support of primary product exports, and the earlier import substitution became progressively eclipsed. Export promotion took the form of diversifying agricultural exports by introducing maize, kenaf, and cassava. During 1950-66 land under cultivation increased 63 percent; the area devoted to rice, the main traditional export, rose by 26 percent. Government infrastructure was developed, and free markets, relatively uncontrolled saving-investment mechanisms and import competition were reestablished through public policy.

Thailand stands out, since the early 1950s, as a viable export-promoting economy in transition. In addition to the above, service exports (tourism, etc.) have grown and accounted for 28 percent of exports in 1969. Eventually import substitution may be revived, as economic nationalism increases and as an urban labor surplus is appearing. If entrepreneurial responsiveness is greater than it was earlier, and public policies are consistent with this kind of growth, that too may become viable. But a return at this stage to the previous controls, and the anti-alien overtones, would risk choking off the growing supply of entrepreneurship.

The Philippines. In the Philippine case, the natural resource condition was somewhat favorable to export promotion though the land

surplus was nearing exhaustion. However, a relatively small modern enclave existed side by side with a massive, backward traditional agricultural sector, relatively unpenetrated by modernizing forces. Indigenous entrepreneurship was not abundant, but a minimum supply of entrepreneurs could be evoked.

In response to these conditions, political leaders opted for a controlled economy. Massive resource transfers to indigenous entrepreneurs, protected from foreign competition, enabled them to pursue a course of import substitution growth. The growth regime created by the control system ran out of steam by the late 1950s, however, and symptoms of distress (idle productive capacity, balance of payments disequilibrium, and capital flight) appeared. Efforts were made to mitigate the deleterious effects of the control system on primary product export growth, and an upsurge of primary product exports followed. However, the evidence suggests that even the moderate reductions of protection and profit transfers from the 1950 levels posed serious problems of adjustment for the "new and necessary" industries. The utilization of capacity and profit rates retreated from their 1950 levels, and the nation was forced to allocate an increasingly large share of its export earnings to cover a growing food deficit.

The progressive decline of the system, notwithstanding the major export promotion policies of 1960-65, induced a search for more basic solutions, beginning in 1966. These gropings toward a new basis for Philippine transition growth focused upon coming to grips with the problem of stagnant traditional agriculture. By the late 1960s the economy's food deficit had been eliminated; but agricultural modernization had failed to progress sufficiently, and the necessary organizational change had not been accomplished, for abandoning import substitution and for the emergence of an export-substitution growth phase. The pattern of faltering import-substitution growth remains.

Indonesia. Of the countries studied, Indonesia entered the transition period with the most unfavorable combination of inherited background conditions. Relative to its large population, which had grown rapidly under colonialism, Indonesia's natural resource base was relatively modest and cannot be considered as equivalent to a land-surplus condition. A special problem in this connection lay in the heavy concentration of population in the island of Java. The Javanese population had been progressively forced back into traditional subsistence agriculture while the colonial economy's export base was shifted from Java to the more sparsely populated outlying islands.

At the time of decolonization, therefore, Indonesia inherited a large backward traditional agricultural sector, incapable of feeding

itself, in combination with a relatively small enclave sector located mainly outside populous Java. The entrepreneurial roles in the enclave sector had been almost completely dominated by non-Indonesians, and the colonial educational system was not conducive to satisfactory postwar development of an indigenous Indonesian entrepreneurial class. In short, Indonesia's colonial heritage was not favorable to either transition genesis system.

Indonesia's turbulent history during 1950-70 reflects the force of these unfavorable background conditions. Political disorder has been associated with the geographical dichotomy between the export enclave and low-income traditional agriculture on Java. These conditions, and a particularly bitter process of decolonization, led to a virulent form of economic nationalism, resulting in the erosion of the colonial export base. Tightly controlled transfers of resources to Indonesian nationals were aggressively attempted to promote import substitution; but the exclusion of non-Indonesian entrepreneurs (who were available) and the failure to rapidly develop indigenous Indonesian entrepreneurial capabilities resulted in two decades of stagnation. As the first attempted transition ends, Indonesia is now struggling toward a compromise solution to begin again--after two decades--to cope with its unfavorable economic heritage.

Taiwan. Taiwan entered independence with severe population pressure upon land, but with favorable conditions in the supply of entrepreneurship and the conditioning of the traditional agricultural sector toward modernization. Withdrawal of Japanese entrepreneurs was offset by immigration of skilled manpower from the Chinese mainland; and the infrastructure and educational facilities built by the Japanese remained. In conjunction with the relative smallness of the enclave sector, these conditions were not conducive to continuation of a land-based primary product growth system. Economic nationalism quickly appeared to foster a brief period of rapid import substitution growth.

During 1950-59 substantial transfers of export profits were made to receptive industrial entrepreneurs. The brevity and success of this early transition phase paved the way for the eventual emergence of a new growth phase, based upon export substitution, and associated with drastic changes in the economy's organization beginning in 1960. Since then, Taiwan has made remarkable progress in laying the foundation for a more advanced transition growth phase. By 1969, 80 percent of its exports were of industrial origin compared to 6 percent in 1952 and 42 percent in 1960.

Taiwan's unique success is explained by particularly favorable background conditions affecting the two most crucial aspects of transition growth--entrepreneurship and agricultural development. These

favorable conditions were a joint product of Japanese rule (which had freely transferred Japanese experience to raise agricultural productivity in its colony in order to expand food supplies) and the historical accident of the transfer of skills from the mainland. The Kuomintang government must also be credited with efficiency and with a continuing concern for agricultural modernization and entrepreneurial development. With the additional benefit of access to large-scale external assistance, Taiwan was able to launch transition growth by a brief and effective import substitution phase and also to achieve conditions for even more rapid growth under export substitution--all within a brief 15-year period.

During the import substitution phase there was a clear protectionist strain in foreign trade policies, strengthening the inducements offered by profit transfers to industrial entrepreneurs. Forced industrial growth was financed from the surplus generated by primary product exports. This organizational milieu provided rapid industrial expansion for several years of import substitution growth, but deceleration began to appear by the mid-1950s, conforming to the inherent exhaustion tendency predicted by our theory. During the second half of the 1950s, the industrial sector responded by turning to the market offered by accelerated modernization of agriculture. Encouraged by government agricultural infrastructure programs and an easing of the earlier policies discriminating against agriculture, industrialists began to shift to production of modern inputs for agriculture.

The feasibility of exploiting new opportunities in the agricultural sector, however, depends upon several crucial preconditions. Perhaps most critical was the history of raising agricultural productivity through introduction of modern inputs during the preceding colonial history. The existence of distributive channels for dissemination of modern inputs, and the acceptability of new technology in the agricultural sector, are important features of such a heritage. Positive public measures during the 1950s, such as land reform, also encouraged agricultural modernization.

The emergence of an export substitution phase after an initial period of transition growth is fundamentally a matter of supply and demand conditions affecting the rise of a disciplined industrial labor force. On the demand side, the major factor is the quality of industrial entrepreneurship, which had been gradually oriented toward market efficiency, encouraged by easing of the control policies of the import substitution phase. Given a labor-surplus condition, the source of labor supply lies in the traditional agricultural sector. With a large and stagnant traditional sector, migration from traditional agriculture tends to occur early in the transition. Migration alone is not enough, however; modernization of traditional agricul-

ture is needed to provide simultaneous release of labor and the surplus food supply required for their maintenance. In this sense, effective labor transfers for industrial growth are contingent upon expansion of agricultural productivity, providing for delivery of growing quantities of food (and raw materials) from traditional agriculture to the industrial sector. If this condition is met, as in Taiwan, an assured supply of "cheap" labor becomes available to meet demand for its utilization in manufacture of labor-intensive export goods. The new export orientation relies upon the comparative advantage of cheap labor services as opposed to land resources.

Successful export substitution also requires diversification of outputs and markets. Industrial entrepreneurs must become increasingly sensitive to market changes and alert to innovation possibilities on the technological front. This very diversification thrust of export substitution will eventually begin to free the open, dualistic economy from its historical difficulties of fluctuating terms of trade and unstable foreign demand for a few primary product exports. The assumption of these new growth functions is contingent upon the development of entrepreneurial capabilities, of gaining the productive efficiency to exploit the economy's labor-surplus comparative advantage in competitive export markets. In practice, this requires the ability to adapt imported capital goods (embodying capital-intensive technology) to the economy's labor-surplus condition. This involves a major change in entrepreneurial behavior from the import substitution phase, when the control system tended to discourage modification of capital-intensive imported technology.

The export substitution phase in the 1960s brought even more rapid growth throughout Taiwan's economy than during the successful import substitution phase. All performance indicators showed marked acceleration. Growth of exports was sharply raised by the diversification resulting from introduction of manufactured consumer goods and processed agricultural products. This produced a rising rate of growth of industrial producer goods imports, and the termination of foreign economi assistance became possible by 1964. Prognostication about Taiwan's future transition growth is somewhat hazardous. Some existing tendencies are apparent; on the one hand, export substitution has increasingly involved the agricultural sector, as industry has evoked supplies of new agricultural raw materials for processing and export. On the other hand, nascent tendencies toward capital good import substitution have also appeared, suggesting that domestic production and export of capital goods may offer opportunities for a new growth phase. Such a pattern of evolution in these two directions is consistent with transition growth in Japan, the one historical example of an open, dualistic economy which evolved to a modern economy in the 20th century.

Development Policy and Strategy Conclusions

We have seen that differing problems of transition growth confront individual countries because contrasting growth types emerge during the transition. An important emphasis for transition policy and strategy is the conception of the transition as an evolutionary process from the colonial economy toward a modern growth economy. This implies that development strategy must focus upon initiating and maintaining a society's progress in terms of those growth accomplishments which are essential to allow the economy to move on from one transition growth phase to a more advanced one. These qualitative changes are essentially a matter of human resource development. In one particular sequence, in Taiwan, the first transition growth phase of import substitution was devoted to creation of a growing cadre of indigenous industrial entrepreneurs, while also creating preconditions for the emergence of a more advanced growth phase. These preconditions consisted of the mobilization of both public and private entrepreneurs for attacking the problem of modernizing agriculture, and their further cooperation in removing controls and protection to encourage adoption of international market criteria of productive efficiency.

A corollary of this cardinal principle of qualitative change is that development policy must focus upon these qualitative transition goals rather than quantitative growth per se. It is entirely conceivable that satisfactory quantitative growth (as measured, e.g., by the rate of growth of real GDP) may not be accompanied by qualitative change conducive to the rise of more advanced transition growth phases. This danger is particularly germane to export promotion systems, which continue the colonial pattern of land-based exports (e.g., petroleum) without encouraging the development of indigenous human resources for new transition growth functions (e.g., Kuwait, Iraq).

The failure is even more striking, however, in the case of countries, such as the Philippines and several Latin American countries, which have suffered prolonged import substitution growth becoming stagnant during the first stage of the transition. Import substitution, and the control system which maintains it, persist where conditions for export substitution are not created through entrepreneurial development in both the public and private sectors. Without organizational reform, particularly the abandonment of controls, and without agricultural modernization to provide productivity increases, labor-intensive industrial exports cannot displace the traditional land-based export orientation. This difficulty has received considerable attention in recent literature, in which there is a tendency to view import substitution and export substitution as alternative opportunities for growth in less developed countries (LDCs). Typically, import substitution systems are castigated while export substitution is praised, and policy changes for initiating the latter are recommended. Our anal-

ysis, however, points to a quite different policy lesson. The basic obstacles to emergence of export substitution are the society's failure to achieve the prerequisites for rapid growth of industrial exports. Human agents must be developed to assume the crucial growth tasks associated with the rise of the new growth phase, and their development must precede the required organizational changes.

Strategic Implications in Particular Countries

Taiwan's transition during the postwar period provides guidelines as a success case among open dualistic economies, offering a perspective to evaluate transition strategy in other LDCs of this type. A first conclusion from Taiwan experience reiterates a lesson from the economic history of advanced countries whose growth was export oriented--e.g., Japan, Denmark, Netherlands and Great Britain. Successful export-led growth requires a continuous process of dynamic adjustment to world market conditions, implying continuous change in the composition of exports. Taiwan, and a handful of other countries (e.g., Korea, Israel) have demonstrated that developing countries in transition can successfully penetrate world markets for labor-intensive manufactured goods, and their accomplishment should dispel the common defeatism about this possibility.

The strategic implication is that export development must be given emphasis throughout the transition. Even during the phase of import substitution, the control policies needed to launch it must be tempered by an emphasis upon competitiveness, as entrepreneurial cadres are created by the easy profit opportunities associated with profit transfers. Once indigenous industrial entrepreneurs have been created, controls and protection must be relaxed to induce them to look beyond the limited domestic market horizons. In Taiwan, assistance for this purpose was offered to entrepreneurs through many promotional and incentive devices, e.g., marketing assistance and duty-free industrial processing zones. Further, the modernization of agriculture is essential, and it should encompass both productivity growth and agricultural diversification. In countries where the agricultural modernization problem is more intractable than in Taiwan (and this appears to be generally true in LDCs), transition strategy must be oriented toward agricultural development from the outset. In the Philippines, for example, further transition growth has been continuously plagued by a backward and neglected agricultural sector.

In Thailand and Malaysia, postwar growth experience to date has been dominated by promotion of primary product exports. The major transition strategy issue now confronting Thailand is the problem of combining the emerging service exports and the prospective import substitution into a viable transition growth system. The policy dilemma is posed in terms of the need to maintain a free-market efficiency orientation for increasing industrial sector exports versus

protection for domestic entrepreneurs for encouraging more rapid substitution of industrial consumer goods imports. Moderate protection may be effective in inducing a domestic entrepreneurial response in import substitution if minority group entrepreneurial talent is not disadvantaged. Prompt withdrawal of protection is essential, however, to encourage industrial entrepreneurs to gradually gain the skills for penetrating competitive foreign markets.

Though Malaysia has followed the same general pattern of primary-product export-based growth as Thailand, the strategy question of future growth sequences is posed in somewhat different terms. Malaysia's transition experience reflects the new political and economic conditions resulting from the 1963 merger between West Malaysia (previously the Federation of Malaya) and East Malaysia (Sabah and Sarawak). West Malaysia has a large modern export product (rubber, tin, palm oil) enclave inherited from colonialism, and postwar policy has focused upon improving productivity in this enclave while also emphasizing the development of the lagging food-producing traditional agricultural sector. However, the deterioration of prices for West Malaysia's chief export (rubber), and slow progress toward export diversification, have placed this dual agricultural development policy in jeopardy. Specifically, these difficulties have created rising pressures for a shift in industry's orientation from export promotion to import substitution. East Malaysia, however, has low population density, and its land-surplus condition offers opportunities for rather easy expansion of primary product exports. Food production has been neglected because the comparative advantage clearly lies in primary product export production. These very different conditions between West and East Malaysia raise significant issues concerning the nature of the transition phase which is emerging from the regional division of labor.

Malaysia appears to have the entrepreneurial resources necessary for the emerging transition phase in its large and skilled Chinese minority with experience in trade and enclave industry. This phase is foreseen as comprising three elements: 1) the development of import substitution industry in West Malaysia under moderate protection, 2) continued expansion of food production in West Malaysia's traditional sector, and 3) emphasis on primary product diversification and growth in the land-surplus area of East Malaysia. In addition to the policy dilemma between protection and free-market efficiency orientation, however, Malaysia must overcome serious political--i.e., ethnic and regional--problems if the emerging phase is to develop into a viable transition growth system: a) Chinese entrepreneurs must be relied upon to forge the import substitution base, under carefully devised protection systems; b) the squeeze upon primary product exports must be modest to avoid regional dissidence and to promote export growth in East Malaysia where opportunities for primary product expansion are best.

In the Philippines, growth has been stalled with the near exhaustion of import substitution since the late 1950s. Neither the emphasis on reviving primary product export promotion, nor the rice production program, have solved this basic problem, though they did serve as palliatives to take the edge off emerging crises. The strategic issue continues to be the creation of conditions from which a phase of export substitution can be successfully launched. Three major policy areas are involved: first and most basic, at both the public and private levels a major reorientation toward productive efficiency in the industrial sector is needed to promote competitiveness in international markets. Entrepreneurs must learn to dispense with the high levels of protection and subsidy that have marked the postwar era. Public leadership is needed to encourage the reorientation toward international standards of efficiency and the search for external market outlets. Second, emphasis upon general agricultural modernization is needed to provide the basis for cheap labor supply and domestic raw materials for exports of manufactured goods. The public sector must provide infrastructure for agricultural modernization (e.g., irrigation, marketing facilities, land reform, and improved transport) while the private industrial sector must introduce new products, new productive methods and intermediate goods. Third, the society's entire development and planning apparatus should be geared to overcoming the present bottlenecks. What is needed is the concentration of the society's planning and fiscal resources on inducing the industrial sector to penetrate foreign markets; many specific policies conducive to this goal may be devised and phased over a three to five year period.

Relationship to Conventional Development Planning

Development plans are currently formulated within a national income accounting framework. Such a framework may be adapted to various levels of aggregation, from a highly aggregated (e.g., Keynesian type) model to a rather detailed level of disaggregation (e.g., input-output models). Plan targets are typically formulated as projected increases in aggregate and sector outputs. Behavioral assumptions appropriate to achieving these targets (e.g., capital/output ratios) are ordinarily taken from historical experience of the economy, or from other countries. The central purpose of applying such planning models is to project through time a consistency in the pattern of resource allocation for the economy as a whole.

If there is any development strategy component implicit in this development planning methodology, it is the preoccupation with maximizing capital formulation. This orientation leads to a mechanistic view of the growth process, in which emphasis is placed upon augmenting the economy's capital resources while abstracting from development of human resources to assume new growth functions. Even the application of planning techniques to human resources is pervaded

by a quantitative, rather than a qualitative, orientation. Thus, planning typically ignores the crucial problems of qualitative growth accomplishment in a transition perspective. Such planning methods fail to discriminate among transition growth types, and strategy guidance, to the extent it occurs, is intuitive and haphazard in nature.

Our transition growth analysis points to quite different directions for a society's major growth targets during the transition from the colonial economy. While quantitative output goals ought to be consistent with each other and with other growth objectives, the major focus of transition strategy should be the gradual evolution of human agents to assume qualitatively new growth functions. These "targets" include the creation of a class of indigenous industrial entrepreneurs, the gradual growth of their technological sophistication and productive efficiency, the penetration of export markets, expansion of employment opportunities for a disciplined and market-oriented labor force, the promotion of modern agricultural enterprise and the evolution of a progressive, development-oriented public bureaucracy. These major human development tasks must be accomplished in sequence, though the order of sequencing in this social learning process may be expected to vary with inherited background conditions. No common sequencing of transition growth accomplishments can be formulated; yet there are general principles applicable to all open, dualistic economies undergoing the transition process that can provide guidance for the use of conventional planning techniques.

The first application of transition strategy to planning involves the overall view of the economy. All development policy must be based upon evidence, especially statistical data, and the appropriate empirical framework is a national income accounting system emphasizing key intersectoral flows. Since interrelationships among industry, agriculture, government, the foreign sector and the finance sector are crucial to growth during all transition phases, relationships on production and income-disposition account among these sectors must constitute the focus of strategy and planning. Just such a framework has been developed for our Southeast Asian studies, and has been used to identify transition phases and measure progress toward new phases.

The second major implication for conventional planning relates to the time perspective. Development strategy should have a long-run time frame of reference embracing the transition as a whole--from the inherited colonial economy to a modern economy. The primary significance of the transition perspective is that it imbues planning with a sequencing content, explicitly recognizing that major growth tasks to be accomplished during the transition must be achieved in specific phases of growth. Two major focuses of planning during each transition growth phase emerge: on the one hand, a dominant objective may be defined as the focal point for planning within the current phase; on the other hand, the sequencing strategy implies a

second focus, the preparation for the next phase of transition growth by gestation policy. For example, where the land-surplus condition for continuation of traditional export growth is not present, an eventual shift to an industrial base requires a first phase of creating indigenous industrial entrepreneurs. Planning during this phase must balance two objectives, the creation of industrial entrepreneurship, and the achievement of preconditions for a subsequent phase in which entrepreneurs will face foreign markets. These twin focuses give specific orientations to the society's planners, by identifying the critical bottlenecks which must be placed at the center of the society's development planning. This type of priority formulation has been lacking in most planning activities in LDCs, causing diffusion of resources among many competing objectives.

The adaptation of conventional resource planning to specific growth tasks during transition phases also has an important policy planning dimension, which is given little recognition in current development planning. In practice the effective scope of conventional development planning is largely confined to direct public sector resource allocation, while the allocation of a much larger body of resources is affected and often controlled by other government policies, frequently quite independently of formal planning objectives and actions. The most critical aspects of planning for transition growth in open economies lie in the areas of exchange rate policy, tariff policy, inflation, domestic trade controls and similar policies which impinge upon the key intersectoral flows. Unless these policies are consistent with the objectives of resource allocation through public sector planning, conventional planning activities are likely to fail in their objectives.

EDITOR'S NOTE: The article above was adapted from the author's summary of conclusions reached after intensive studies of the aforementioned Southeast Asian countries by the Center for Development Planning, National Planning Association (NPA), Washington, D. C., between 1965 and 1970. The research was financed by the U.S. Agency for International Development (AID) under its research program. The following products of this research are available in mimeographed form from AID Missions, or AID/Washington, on request: Douglas S. Paauw, Development Strategies in Open Dualistic Economies (Summary Report, NPA, 1970); Douglas S. Paauw and John C. H. Fei, The Transition in Open Dualistic Economies (the basic overall report, 715 pp., to be published); Alek A. Rozental, Finance and Development in Thailand (New York: Praeger Publishers, 1970); George L. Hicks and Geoffrey McNicoll, Foreign Trade and the Growth of the Dual Economy: A Study of the Philippines 1950-1966 (Ithaca, N.Y.: Cornell University Press, in press); Eliezer B. Ayal, Manufacturing and Economic Growth: An Application to the Philippines (NPA, 1969); and Joseph L. Tryon, The Behavior of Production, Prices and Productivity in Philippine Agriculture (NPA, 1968).

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